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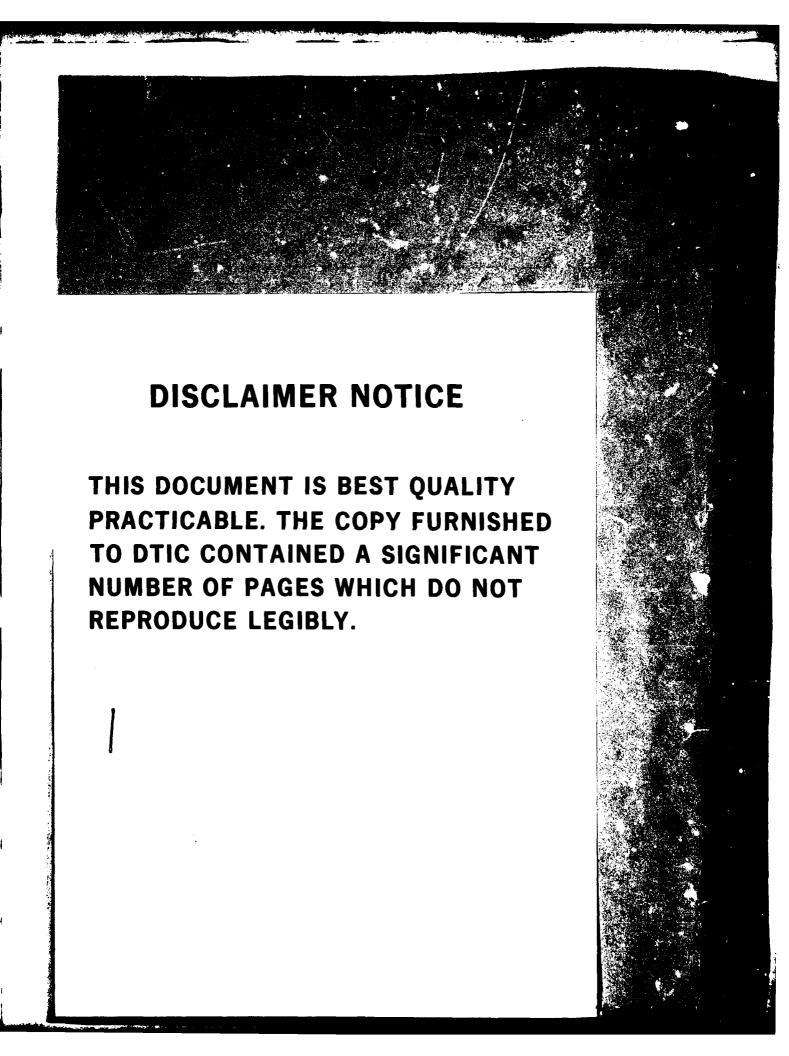
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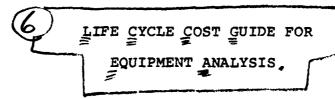
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PREPARED FOR
NAVAL MATERIAL COMMAND

BY

THE NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY
MANAGEMENT ENGINEERING DEPARTMENT

COST MANAGEMENT DIVISION

Jan 77

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ABSTRACT

The Life Cycle Cost Guide for Equipment Analysis updates and supercedes the Life Cycle Cost Guide for Government Furnished Equipment and its associated Customer Support Package. This document differs extensively from the previous guide in cost model structure, in equation and cost factor description, and in computer program structure. The major changes are:

- The total Life Cycle Cost was divided into three major cost elements: Research & Development, Investment, and Operation & Support;
- The entire Cost Breakdown structure was revised, new cost elements were added, and new equations and cost factors were introduced. Program Management and Termination Costs have also been included;
- Four types of yearly inflation rates (Research and Development Procurement, Military Construction, and Operation and Maintenance) and yearly discount rates were included to calculate costs in terms of inflated or inflated & discounted dollars;
- This program maintains the previous report structure; however, new reports are provided: Equations, Cost Adjustment factors, Funding by Cost Category, Cost Breakdown by Year, and Annual Cost by Funding Type. These reports are available in constant dollars, inflated dollars, or inflated & discounted dollars. The reports can be selectively requested.
- The new computer program enables the analyst to modify the standard Life Cycle Cost Model to his specific project needs without making any program changes. The format of the reports is automatically adjusted for all changes.



MANAGEMENT SUMMARY

The Life Cycle Cost Guide for Equipment Analysis is a standardized and automated Life Cycle Cost Methodology provided by the Naval Material Command to be used in the Life Cycle Cost Analysis of equipments procured for the Navy.

The total Life Cycle Cost is divided into three major cost elements: Research & Development, Investment, and Operating & Support Costs. These cost elements are divided into 85 subcost elements, 61 of which comprise the basic equations. The basic equations are further defined by 104 cost factors.

Each equation is identified as belonging to a cost category, i.e., Contractor Payment, Program Management, Testing, Prime Equipment, Training, Supply Support, Technical Data, Support Equipment, Operation, or Maintenance, and a funding type i.e., Research & Development, Procurement, Construction, Operation & Maintenance, Military Personnel, or Others. The costs can be adjusted to reflect the time value of money.

The program provides 13 reports at different depths of detail and with various types of information. These reports are grouped into two basic categories:

A. Input Data Reports present the input data and the information built in the program in five formats to provide the basic information about the cost model, the cost factor description, values, and general remarks about the project.

These reports are:

- 1. Equations
- 2. Remarks
- 3. Dictionary
- 4. Variable Values
- 5. Cost Adjustment Factors
- B. Output Reports present the calculated values of the Life Cycle Cost in eight formats. These reports are:
 - 1. Summary
 - 2. Funding by Cost Category
 - 3. Cost Breakdown by Year
 - 4. Cost Breakdown Totals
 - 5. General Funding
 - 6. Annual cost by Funding Type
 - 7. Annual Cost by Cost Category
 - 8. Sensitivity Analysis

The computer program developed for the Life Cycle Cost Equipment Model is designed to provide the analyst the flexibility to modify the standard Life Cycle Cost model to his specific project needs. The procedures are user-oriented and do not require any computer program changes. Using this technique, the analyst can redefine the entire cost structure.

This special programming technique provides the user a program readily available to be adopted to various types of cost models. This technique has been successfully demonstrated in many on-going projects and was also used for the development of the Major Weapon System Life Cycle Cost Model.

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- NAVMAT Equipment LCC Model Cost Equations NAVMAT Equipment LCC Model Cost Factors, Names, and Descriptions, Dimensions, and Sources В.
- C.
- Inflation/Discounting Adjustment Factors
 NAVMAT Equipment LCC Model Sample Computer Run D.
- FLEX Technique Sample Computer Run

LIFE CYCLE COST GUIDE FOR EQUIPMENT ANALYSIS

I. SCOPE

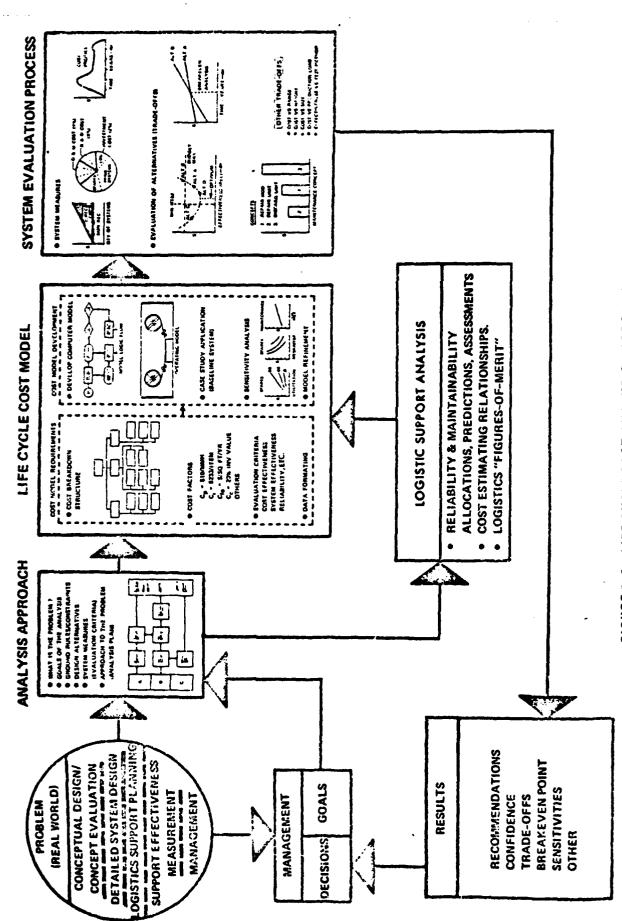
The purpose of this guide is to provide a basic understanding of the methodology used in the LCC (Life Cycle Cost) analysis of equipment procured for the Navy. Figure I.1 provides an overview of the LCC analysis approach for Naval Material Command procurements. Sections II & III and associated Appendices describe the Naval Material Command Equipment LCC methodology and the procedures for data collection. Sections IV, V & VI and associated Appendices describe the ADP (Automatic Data Processing) model available for use in calculating Life Cycle Cost.

By standardizing and automating the costing methodology, the Naval Material Command has provided the System Commands with an effective tool for using Life Cycle Costing in their procurement decisions.

II. LIFE CYCLE COST METHODOLOGY

Life cycle cost is defined as the total cost to the Government of acquisition and ownership of an equipment over its full life. It includes the cost of development, investment, and operating & support.

This section establishes a standardized life cycle cost estimating model for identifying and assembling cost elements and cost categories for Equipments.



. 2

FIGURE 1-1. LIFE CYCLE COST ANALYSIS APPROACH

The life cycle cost breakdown structure provides a framework for collecting, analyzing, estimating, synthesizing, computerizing, and reporting life cycle costs. It provides a check list to assure that all pertinent costs are included in the analysis without duplication. It also provides the basic structure for keeping track of the various costs and aggregating them into summary cost elements. Each of the costs are identified by year and then adjusted as required in accordance with the time value of money theory as described in Appendix C (Inflation/Discounting Adjustment Factors).

The total life cycle cost is divided into three major cost elements: Research & Development, Investment, and Operating & Support costs. These cost elements are then divided into 85 sub-cost elements, 61 of which comprise the basic equations which quantify the major cost elements. The calculation of these costs and their summation into a total life cycle cost form the basis of the LCC Methodology. The standard cost equations in the LCC model uses 104 major cost factors. These factors are the bits and pieces of information which are usually generated during the process of equipment procurement, acquisition, and ownership.

The Life Cycle Cost Breakdown Structure and Equation Directory which identifies cost category, funding type,

and the inflation factor type assigned to each basic equation is provided in table II.1

Appendix A provides the basic cost equations and cost factor descriptions.

Appendix B provides an alphabetical listing of the 104 Life Cycle Cost factor names, descriptions, dimensions, and the likely source of information used in the cost equations.

Every cost equation identified in the Equipment Life Cycle Cost model is assigned to one of ten major cost categories. For reference purposes, each is assigned a numerical code. These Cost Categories and their assigned code numbers in the Equation Directory are:

Contractor Payment	1
Program Management	2
Testing	3
Prime Equipment	4
Training	5
Supply Support	6
Technical Data	7
Support Equipment	8
Operation	9
Maintenance	10

Every cost equation is assigned to one of six funding types. These funding types and their code numbers in the Equation Directory are:

Research & Development	1
Procurement	2
Construction	3
Operation & Maintenance	4
Military Personnel	5
Others	6

LIFE CYCLE COST BREAKDOWN STRUCTURE AND

	COST BREAKDOWN STRUCTURE AND			_ }
	EQUATION DIRECTORY	Cost	Fund	Infl.
CBS NO		Cat.	Type	Type
000000	TOTAL LIFE CYCLE			
				,
100000	RESEARCH AND DEVELOPMENT			3
110000	Validation			
111000	Contractor	1	1	1
112000	Government	2	1	1
120000	Full Scale Development			
121000	Contractor			
121100	Management	1	1	1
121200	Engineering	1	1	1 .
121300	Prototype Hardware	1	1	1
121400	Software	1 1 1 1	1	1 1 1 1
121500	Test & Evaluation	1	1	1
121600	Documentation	1	1	1
121700	Support & Test Equipment	1	1	1
122000	Government			
122100	Program Management	2	1	1
122200	Prototype Test & Evaluation			
122210	Training	5	5	4
122220	Test Site Activation	5 3 3	3	4
122230	Test & Evaluation	3	ī	ī
12230	100 4 1/414410	•	-	_
200000	INVESTMENT			
210000	Government Program Management	2	2	1
220000	Prime Equipment Acquisition	_	_	_
221000	Production Hardware	4	2	2
222000	Production Support & Services	4	2	2 2 2 2 2
223000	Production Test & Evaluation	3	2	2
224000	Transportation	4	2	$\bar{2}$
225000	Installation and Checkout	4	2	2
230000	Initial Support Acquisition	*	-	-
231000	Support & Test Equipment Acquisition	n 8	2	2
232000	Supply Support		-	-
232100	Initial Spares			
232110	Prime Equipment	6	2	2
232120	Support & Test Equipment	6	2	2 2
2322200	NSN Entry into the Supply System		4	4
232200	Facilities	U	•	*
233100	Operational	9	3	3
233200	Maintenance	10	3	3 3
233200	Documentation	10	3	,
234100	Acquisition	7	2	2
234200	Reproduction and Distribution	7	2	2 2
	Training	,	4	2
235000		c	E	4
235100	Operator) E	5	
235200	O/I level Maintenance	5 5 5 5	5	4
235300	Depot level Maintenance	2	4	4
235400	Instructor	5 5	5 2	4 2
235500	Training Aids	כ	2	2

LIFE CYCLE COST BREAKDOWN STRUCTURE AND EQUATION DIRECTORY

EQUATION DIRECTORY			
	Cost	Fund	Infl
	Cat.	Type	Type
OPERATING AND SUPPORT			
Operation			
Personnel	9	5	4
Facilities	9	3	3
Energy Consumption			4
	9		4
	9	4	4
	_	_	-
	10	5	4
			4
			4
			4
		•	•
Material Handling Labor	3.0	4	4
			4
			4
	10	7	7
	10	5	4
— ··			4
	10	7	7
	1.0	A	4
			4
			4
			4
	10	4	7
			r
	1.0	2	2
		2	3 3
	10	3	,
	10	2	2
			3 3
			3 4
	′	4	4
	c	A	4
		7	-
	υ	4	4
		_	
O/T Tamel Maintenance	5	5	4
	5		4
			4
Termination	6	4	4
	OPERATING AND SUPPORT Operation Personnel	Cost Cat.	OPERATING AND SUPPORT Coperation Personnel 9 5 Personnel 9 5 5 9 3 Energy Consumption 9 4 Material Consumption 9 4 Material Consumption 9 4 Material Consumption 9 4 Software Maintenance 9 4 Software Maintenance 9 4 Support 7 6 4 Support 7 10 5 10 5 10 10 5 10 10 5 10 10 10 4 10 4 10 4 4 10 4 <td< td=""></td<>

Table II.1 (Continued)

Each cost equation in the Equipment Life Cycle Cost model can be adjusted for the time value of money by one of four types of inflation factors and one discount factor. These inflation factors and their code numbers in the Equation Directory are:

R & D 1 Procurement 2 Construction 3 O & M 4

Operation & Maintenance and Military Personnel are assumed to use the same O&M type of inflation factor. Funding type "Others" could use any one of the inflation factors.

III. DATA COLLECTION

Life Cycle Cost analysis requires the collection and processing of 104 cost factors. The principle data sources are the System Project Office, the Contractor, and the Logistic Support organization. The Project Management Office will provide data concerning the system operations, acquisition costs, project schedules and various contractual related information. Information pertaining to the inherent design characteristics of the system will be available from the contractor. The ILS Manager and his Logistic Element Managers will have access to data on maintenance, personnel & training, technical data, transportation, etc., during the ownership period. The analyst will be required to provide all other cost factors by converting some of the raw data collected during the interviews into applicable information.

It is recommended that the cost equations' description presented in section II be used as a guide during the interviews.

The basic steps in the data collection and processing are the same whether life cycle costs are calculated manually or by using the ADP program. The ADP method simplifies the calculation requirements, but it also requires an analyst to become familiar with translating LCC factors into a format acceptable to a computer.

Sections IV & V will provide information on how to use the ADP technique for the NAVMAT LCC model. Section VI will present the FLEX technique on how to modify the standard NAVMAT Equipment LCC Model.

IV. AUTOMATIC DATA PROCESSING

Although an analyst can use the model without knowing all the details of the calculations, a general knowledge of the logical content contained in the model is useful in properly developing input data, in properly interpreting results and in appreciating the capabilities and limitations of the model.

The LCC model consists of three functional processes:

A. ADP Model Input Logic

Like any computer model, a problem to be analyzed by the LCC model must be presented in the form of input data

of particular types. Once the analyst has prepared data on the input forms, the data is converted to punched cards. Each type of data card is read in and the data is converted to a form needed for subsequent operations. The model routines that process input data also apply various logical tests to verify that the data is correct and complete within certain limits. If these tests or edit checks uncover discrepancies in the data, error messages are produced. For some errors operation of the model will stop, while for others processing will continue. The input routines also provide reports of the input data which are returned to the analyst along with results of the output reports. These input reports can be used to check that the data has been properly entered. They also serve as ready reference for interpreting the results of the model. Once all input data is read in and established in arrays, the logical process of the model automatically begins. All of the processing is done internally and does not require the attention or intervention of the analyst.

B. Cost Calculations

In calculating Life Cycle Cost, the model considers the hierarchal structure of the cost elements that have been defined in section II. The cost of a cost element is the sum of the indentured cost elements below it. For example: total life cycle cost is calculated as the sum of the Research

& Development, Investment, and Operating & Support costs.

This feature requires that only those cost elements that do not have lower indentured cost elements need be described by equations. The model calculates the cost of each equation by year. These costs are then adjusted as required by the time value of money theory.

Every cost element described by an equation also has identified with it a life cycle phase, cost category, funding type, and adjustment factor.

C. Reports

The purpose of a life cycle methodology is to take the diverse bits of information describing a specific bid or set of circumstances and produce a unique value called the total life cycle cost. The comparison of the LCC values provides the System Project Manager with an important decision-making factor. The ADP program provides various reports at different depth of detail and types of information that are grouped into two basic categories:

1. Input Data Reports

These are the reports that present the input data and the built-in information in various formats to provide the basic information about the cost model, the cost parameter description and values, and the general remarks about the project. These reports are:

(a) Equations

This is the listing of the cost breakdown structure and associated equations (in reversed Polish notation). Identified with cost breakdown structure number, cost element description, and cost equations.

(b) Remarks

This is the listing of the remarks included for explanatory purposes.

(c) Dictionary

This is the alphabetical listing of the input parameter names, definitions and associated units of the cost factors.

(d) Variable values

This is the alphabetical listing of the names, definitions, units, and values of the cost factors.

(e) Cost adjustment factors

This is the listing of the annual inflated, inflated and discounted, and discounted cost adjustment factors.

2. Output Reports

These are the reports that present the calculated values of the life cycle cost in various formats. There are eight computer generated reports:

- (a) The SUMMARY report presents the total life cycle cost cross-referenced by the major cost categories and the cost elements.
- (b) The FUNDING VS. COST CATEGORY report presents the total life cycle cost cross-referenced by the major cost categories and funding types.
- (c) The COST BREAKDOWN BY YEAR report presents the yearly breakdown of the basic cost elements.
- (d) The COST BREAKDOWN TOTALS report presents the total life cycle cost of each basic cost element. The cost of each basic cost element is also expressed as a percentage of total LCC.
- (e) The GENERAL FUNDING report presents the total life cycle cost cross-referenced by funding types.
- (f) The ANNUAL COST BY FUNDING TYPE report presents the total life cycle cost by year by funding type.
- (g) The ANNUAL COST BY COST CATEGORY report presents the total life cycle cost by year by cost category.
- (h) The SENSITIVITY ANALYSIS report summarizes the effect of varying a single cost factor's value on the total life cycle cost.

V. NAVMAT EQUIPMENT LCC MODEL INPUT FORMATS

The operation of the Equipment Life Cycle Cost model requires that a variety of input data be prepared by the analyst to describe the equipment being analyzed. A Run

Deck sequence of the computer cards is shown in figure V.1.

A NAVMAT Equipment LCC model sample computer run is provided in Appendix D. There are five types of input formats required from the analyst. These are:

A. Analysis Identification

This form identifies the analysis and prints the title on the cover page and on the succeeding report pages. The maximum number of characters for the analysis identification is 100. The identification is to be contained in columns 1 through 80 of the first card and columns 1 through 20 of the second card (if required). All characters will appear as the analysis identification on each report page; if no information is given then "No analysis identification was provided" will be printed.

B. Control Options Card (CN card)

The control options card (CN card) has several switches to suppress printing of reports.

Input Data Reports are selectively printed or not printed in accordance with the following code:

Output Reports are selectively printed or not printed in accordance with the following code:

- 0 or blank = No report printed
 - l = Report printed in constant dollars
 - 2 = Report printed in inflated dollars
 - 4 = Report printed in inflated and discounted dollars

LCCFLEX RUN DECK SEQUENCE

```
//NWQPxxxx JOB (13440dii,C,U,N),'LCC-Analyst's name)
  // EXEC LCCFLEX,RUN=1,LINES=5000
  //IDENT DD *
: Identification cards go in here
  //CS DD *
: CS and EQ cards go in here
: Referred to as CS FILE and used only for FLEX option :
  //NV DD *
: NV and DS cards go in here
: Referred to as NV FILE and used only for FLEX option :
  //DATA DD *
: CN card
: RM cards
  &INPUT
  NAMELIST input data cards go in here
  & END
: SA Sensitivity analysis cards go in here
 //
XXXX
     Project identification
đ
      department code
ii
      Analyst's initials
```

If more than one type of printout is desired, simply add the integer of the individual reports and enter the resultant number. For example, the number 3 (1+2) will produce two reports, one in constant dollars and the other in inflated dollars. An entry of 7 (1+2+4) will produce three reports, one in constant dollars, one in inflated dollars, and one in inflated and discounted dollars.

The last switch on the form provides the user with an option of entering the adjustment factor for inflation in the form of either the inflation rate or the inflation factor. The switch is controlled as follows:

If there is no CN card all of the reports will be printed.

The format of the CN card is as follows:

Column(s)	Description
1-2	Card type "CN"
3	Equation
3 4 5	Remarks
5	Dictionary
6	Built-in variable values
7	User input variable values (Used only for
	LCCFLEX)
8	Cost adjustment factors
9	Summary
10	Funding by cost category
11	Cost breakdown by year
12	Cost breakdown totals
13	General funding
14	Annual cost by funding
15	Annual cost by cost categories
16	Sensitivity analysis
17-19	Not used

20 Inflation rate/factor input option 21-80 Not used

C. Remark Cards (RM cards)

The remark cards allow the user to describe or provide additional information for explanatory purposes. The remarks entered in this format are printed on a seperate output page. If no remark card is used, "No remarks" is printed. Each remark card should be coded with the characters RM on the first and the second column of the card. The user can include as many RM cards as needed.

D. & Input Card (for NAMELIST input)

The basic input data is entered on NAMELIST input cards. NAMELIST is a special input processing technique that allows a great deal of freedom and brevity in providing input data to a program.

Certain rules govern the use of the NAMELIST technique; these rules are described here. The first card for NAMELIST input must have "&" in column 2 followed by a NAMELIST name (for this program that name is input) and the name followed by a blank. Subsequent cards do not use this identification but column 1 must be blank. The end of NAMELIST data is signified by entering "&END" after the final model input data. Data is entered in the format "Variable name = Variable value." If the variable is defined as an integer (in this program only dimensioned

scalars are integers), the value must be an integer (not contain a decimal point). Embedded blanks in the name or value are illegal, but blanks may appear before or after each (CAUTION: Blanks after a value with no decimal point will be interpreted as zeros). A comma must be used to delimit and separate data entries. Input to arrays may be done in one of several ways. Some of these ways are illustrated in the following example.

Assume an array "A" dimensioned by three, into which it is desired to enter the value 8, 8, 5. This can be done, under NAMELIST input by:

In the last form, the program will take the first value as default for the second.

A(1)=8., A(3)=5.,

The Government Furnished Equipment Life Cycle Cost model contains 104 cost factors which are written in the NAMELIST format. There are three types of cost factors:

1. Scalars

These are the single value cost factors. There are 43 scalars in the LCC Equipment model. All scalars have

a range varying from 0 to 10 except scalars "BY" and "IYI", which are restricted to vary from 1 to 30, and scalar 'TERM' 9 9 9 which varies from -10 to 10. Scalar names are listed in alphabetical order as follows:

BY	CE	CIPE	CM	CP	CSD	CSI
cso	CTI	CTM	CTO	CTP	CTPE	CU
FDRT	FILS	FIRT	FII	FPST	IYI	NP
NSNP	NSNS	OHL	ОНМ	OHT	OT	PO
PSOS	RAM	RAP	RDM	RIE	RIM	RO
RPL	RPM	RSD	RSL	RSR	STEM	STES
TERM						

2. Dimensioning Scalars

These are the single value cost factors governing the dimensions of the arrays. There are three dimensioning scalars in the NAVMAT Equipment LCC Model. Dimensioning scalars and their respective minimum and maximum range values are listed as follows:

Name	<u>Min.</u> range	Max. range
NK	I	500
NM	1	10
Y	1	30

3. Arrays

These are the subscripted multiple entry cost factors. Dimensions of these arrays are controlled by dimensioning scalars. All arrays have a range varying from 0 to 9 10 except arrays "R", "FR" and "NPM" are restricted to a minimum of 0.01 to avoid division by zero during calculations.

There are 58 arrays in the Equipment LCC model. The listing of the arrays by dimension type are as follows:

(a) The 44 arrays subscripted by "I" and dimensioned by "Y" (which has a range from 1 to 30) are as follows:

AD	ADC	ADG	ATU	CS	DCD	DCE
DCH	DCPM	DCS	DCST	DCTE	DGPM	DGTA
DGTE	DGTT	DR	FMS	FOS	FR	IRCON
IROM	IRPROC	IŖRD	ISSD	ISSI	LO	LM
LP	MSSD	MSSI	N	NC	NN	NOH
NPO	PMG	PSS	PTE	PTI	PTM	PTO
PTP	STE					

(b) The ll arrays subscripted by "K" and dimensioned by "NK" (which has a range from 1 to 500) are as follows:

CST DC DSC LSD LSI LSO QTY

R RSS RW W

(c) The 3 arrays subscripted by "N" and dimensioned

by "NM" (which has a range from 1 to 10) are as follows:

LPM MPM NPM

An alphabetically sequenced Life Cycle Cost Directory with names and descriptions of the Cost Factors is provided in table V.1.

Table V.2 presents the Life Cycle Cost Factor-Equation Directory which provides a cross reference of the Cost Factors and the Equations in which they are used.

LIFE CYCLE COST FACTOR DIRECTORY

NAME	DESCRIPTION
AD(I)	Acquisition cost of data during investment period
	(\$/yr)
ADC(I)	Government payments to the contractor for tech-
	nical and Managerial work performed during valida-
	tion phase (\$/year)
ADG(I)	Government expenditures for technical and managerial
	work performed during validation phase (\$/yr)
ATU(I)	Acquisition, transportation, and installation costs
	of training aids and devices during initial train-
	ing (\$/yr)
BY	Base year during/from which all cost adjustments
	are made (Dimensionless)
CE	Energy consumption cost incurred during the opera-
	tion of the prime equipment (\$/hr/equip)
CIPE	Installation cost of the prime equipment (\$/equip)
CM	Cost of materials consumed during the operation
	of the prime equipment
CP	Average cost per page of set-up, reproduction and
	distribution of technical manuals (\$/page/copy)
CS(I)	Software maintenance cost during prime equipment
	operation (\$/yr)
CSD	Area cost for depot level maintenance (\$/sq.ft/yr)
CSI	Area cost for O/I level maintenance space
	(\$/sq.ft./yr)

NAME	DESCRIPTION
CSO	Area cost for operational space (\$/sq.ft./yr)
CST(K)	Unit cost of the Kth spare/repair item (\$/item)
CTI	Average instructor training cost for personnel
	pay and allowance travel and course fees (\$/student)
CTM	Average O/I maintenance personnel training cost
	for pay and allowance, travel and course fees
	(\$/student)
CTO	Average operating personnel training costs for pay
	and allowance, travel and course fees (\$/student)
CTP	Average depot maintenance personnel training costs
	for pay and allowance, travel and course fees
	(\$/student)
CTPE	Transportation cost of prime equipment from con-
	tractors facility to installation site (\$/equip)
CU	Unit price of one of the contractors equipment
	(\$/equip)
DC(K)	Duty cycle in the Kth spare/repair item (Ratio)
DCD(I)	Payment by the government to the contractor for all
	the data acquired during full scale development
·	(\$/yr)
DCE(I)	Payment by the government to the contractor for
	the engineering efforts during full scale develop-
	ment (\$/yr)

NAME	DESCRIPTION
DCH(I)	Payment by the government to the contractor hard-
	ware development efforts during full scale develop-
	ment (\$/yr)
DCPM(I)	Payment by the government to the contractor manage-
	ment efforts during full scale development (\$/yr)
DCS(I)	Payment by the government to the contractor soft-
	ware development effort during full scale develop-
	ment (\$/yr)
DCST(I)	Payment by the government to the contractor S&TE
	development effort during full scale development
	(\$/yr)
DCTE(I)	Payment by the government to the contractor test
	and evaluation efforts during full scale develop-
	ment (\$/yr)
DGPM(I)	Government project management costs incurred during
	full scale development (\$/yr)
DGTA(I)	Government costs for test site activation/deactiva-
	tion during full scale development T&E program
	(\$/yr)
DGTE(I)	Government personnel costs incurred during full
	scale development T&E program for testing and evalua-
	tion (\$/yr)
DGTT(I)	Government cost to train students during full scale
	development test and evaluation program (\$/yr)
DR(I)	Annual discount rate for future costs (ratio)

NAME	DESCRIPTION
DSC(K)	Discard rate of the Kth spare/repair item (ratio)
FDRT	Required stockage time for depot level repair-
	able items at O/I and depot level (days)
FILS	Required stockage time for replenishment spares at
	O/I level (days)
FIRT	Repair cycle time for repairable items at O/I level
	(days)
FM	Repair material rate (ratio)
FMS(I)	Maintenance site construction/preparation costs
	during investment period (\$/yr)
FOS(I)	Operational site construction/preparation costs
	during investment period (\$/yr)
FPST	Procurement lead and safety level stockage time for
	initial spare and repair parts (days)
FR(I)	Reliability improvement or degridation factor
	(dimensionless)
<pre>IRCON(I)</pre>	Annual inflation rate for future costs for con-
	struction type of funding (ratio)
IROM(I)	Annual inflation rate for future costs of O&M type
	of funding (ratio)
IRPROC(I)	Annual inflation rate for future costs of procure-
	ment type funding (ratio)
IRRD(I)	Annual inflation rate for future costs of R&D type
	of funding (ratio)

NAME	DESCRIPTION
ISSD(I)	Storage space required for the depot inventory
	(sq.ft./yr)
ISSI(I)	Storage space required for the O/I inventory
	(sq.ft./yr)
IYI	Year during which initial cost occur (dimensionless)
LO(I)	Desired manning level for operating personnel
	(personnel/yr)
LM(I)	Desired manning level for O/I level maintenance
	personnel (personnel/yr)
LP(I)	Desired manning level for depot level maintenance
	<pre>personnel (personnel/yr)</pre>
LPM(N)	Preventive maintenance labor time for Nth main-
	tenance action (hr/action)
LSD(K)	Depot maintenance labor time to repair the Kth
	item (hr/item)
LSI(K)	O/I level maintenance labor time to repair the Kth
	item (hr/item)
LSO(K)	O/I level maintenance labor time to remove and
	replace the Kth item (hr/item)
MPM(N)	Material cost for Nth type of preventive main-
	tenance action (\$/action)
MSSD(I)	Shop space required for depot level maintenance
	(sq.ft./yr)
MSSI(I)	Shop space required for O/I level maintenance
	(sq. ft./yr)

NAME	DESCRIPTION
N(I)	Number of equipments in the Navy's inventory system
	(equip/yr)
NC(I)	Number of copies of technical data to be distributed
	and inventoried (copies/yr)
NK	Total number of spare/repair items in the prime
	equipment (dimensionless)
NM	Total number of preventive maintenance types of
	the prime equipment (dimensionless)
NN(I)	Prime equipment annual acceptance schedule (equip/
	yr)
NOH(I)	Prime equipment overhaul schedule (equip/yr)
NP	Number of pages per technical manual maintained
	by Navy (pages/copy)
NPM(N)	Time between inspections of the preventive main-
	tenance actions (hr/action)
NPO(I)	Prime equipment phase out schedule (equip/yr)
nsnp	Total number of new National Stock Numbers to be
	issued on the prime equipment (NSN)
NSNS	Total number of new National Stock Numbers to be
	issued on the peculiar S&TE equipments (NSN)
OHL	Prime equipment overhaul maintenance labor time
	(hr/eguip)
ОНМ	Prime equipment overhaul maintenance material cost
	(\$/equip)

NAME	DESCRIPTION
OHT	Prime equipment overhaul maintenance material
	shipping rate (\$/equip)
OT	Prime equipment annual operating time (hrs/equip/yr)
PMG(I)	Government project management costs incurred during
	investment period (\$/yr)
PO	Number of personnel required to operate a prime
	equipment (personnel/equip)
PSOS	Floor space required for the operation of a prime
	equipment (sq.ft./equip)
PSS(I)	Production support & services cost incurred during
	the investment period (\$/yr)
PTE(I)	Production test & evaluation costs incurred during
. · ·	the investment period (\$/yr)
PTI(I)	Number of instructors to receive initial training
	(student/yr)
PTM(I)	Number of O/I Maintenance personnel to receive
	initial training (student/yr)
PTO(I)	Number of operating personnel to receive initial
	training (student/yr)
PTP(I)	Number of depot maintenance personnel to receive
	initial training (student/yr)
QTY(K)	Number of quantities of a spare/repair item
	(quantity/item)
R(K)	Mean time between failures of the spare/repair
	item (hr/item)

NAME	DESCRIPTION
RAM	Operator and O/I level maintenance personnel at-
	trition rate (ratio)
RAP	Depot level maintenance personnel attrition rate
	(ratio)
RDM	Technical data management cost for file maintenance
	(\$/page/yr)
RIE	Average National Stock Number (NSN) entry cost
	into the supply system (\$/NSN)
RIM	Supply support management item retention and field
	administration cost (\$/NSN)
RO	Prime equipment operator hourly pay rate (\$/hr/
	operator)
RPL	Packaging labor cost (\$/lb)
RPM	Packaging material cost (\$/1b)
RSD	Depot Maintenance personnel pay rate to repair
	items (\$/hr/man)
RSL	O/I maintenance personnel pay rate to remove, re-
	<pre>place or repair failed items (\$/hr/man)</pre>
RSR	Average shipping cost (\$/lb)
RSS(K)	Fraction of failures repaired at the intermediate
	maintenance level for the Kth item (ratio)
RW(K)	Ratio of the shipping weight to the unpacked weight
	of the Kth item (ratio)
STE(I)	Support & test equipment acquisition cost (\$/yr)

Table V.1 (continued)

NAME	DESCRIPTION
STEM	Support & test equipment initial support rate,
	percent of S&TE acquisition cost (ratio)
STES	Support & test equipment recurring support cost
	per prime equipment (\$/equip)
TERM	Termination cost and/or value of the prime equip-
	ment (\$/equip)
W(K)	Unpacked weight of the Kth item (lb/item)
Y	Number of years covered by the life cycle analy-
	sis (dimensionless)

LIFE CYCLE COST FACTOR-EQUATION REFERENCE DIRECTORY

NAME	CBS NUMBER	NAME	CBS NUMBER
AD(I)	234100	CU	221000
ADC(I)	111000	DC(K)	232110 321110
ADG(I)	112000		321120 321130
ATU(I)	235500		321200 321310
BY	ALL		321320 321330
CE	313000		327100
CIPE	225000	DCD(I)	121600
CM	314000	DCE(I)	121200
CP	234200	DCH(I)	121300
CS(I)	315000	DCPM(I)	121100
CSD	325120 325220	DCS(I)	121400
CSI	325110	DCST(I)	121700
	325210	DCTE(I)	121500
CSO	312000	DGPM(I)	122100
CST(K)	232110 321200	DGTA(I)	122220
	327100	DGTE(I)	122230
CTI	235400	DGTT(I)	122210
CTM	235200 328200	DR(I)	ALL
СТО	235100	DSC(K)	232110 321120
CMD	328100		321130 321200
CTP	235300 328300		321310 321320
CTPE	224000		321330 327100

Table V.2

NAME	CBS NUMBER	NAME	CBS NUMBER
FDTR	232110	IROM(I)	321310
FILS	232110	(cont.)	321320 321330
FIRT	232110		322100 322200
FM	321200		323100 323200
FMS(I)	233200		323300 324000
FOS(I)	233100		326000 327100
FPST	232110		327200 328100
FR(I)	232110 321110 321120		328200 328300 330000
	321130 321200 321310 321320 321330 327100	IRPROC(I)	221000 222000 223000 224000 225000 231000
IRCON(I)	122220 233100 233200 312000 325110		232110 232120 234100 234200 235500
	325120 325210 325220	IRRD(I)	111000 112000 121100 121200 121300
IROM(I)	122210 232200 235100 235200 235300 235400 311000 313000		121400 121500 121600 121700 122100 122230 210000
	314000 315000	ISSD(I)	325220
	321110 321120	ISSI(I)	325210
	321130 321200	IXI	232200 326000 327200

Table V.2 (cont.)

CBS NUMBER	NAME	CBS NUMBER
328100	им	322100 322200
328200	**** / * }	
328300	NN(I)	221000 224000 225000
322100		232110
321130	NOH(I)	323100 323200
321120		323300
321110	NP	234200 326000
322200	NIDW (NI)	322100
325120	WEM (N)	322200
325110	NPO(I)	330000
311000 312000 313000	NSPN	232200 327200
314000 321110	NSNS	232200 327200
321130	OHL	323100
321310	ОНМ	323200
321330	OHT	323300
322200	OT	232110
324000 327100		311000 313000 314000
234200		321110 321120
232110 321110 321120 321130 321200 321310 321320 321330 327100		321120 321200 321310 321320 321330 322100 322200 327100
	328100 328200 328300 322100 321130 321120 321110 322200 325120 325110 311000 312000 313000 314000 321110 321120 321130 321200 321310 321320 321310 321300 322200 324000 327100 234200 232110 321120 321130 32130 32130 32130 32130 32130 32130 32130 32130 321310 321320	328100 NM 328200 328300 322100 321130 NOH(I) 321120 321110 NP 322200 NPM(N) 325120 311000 NSPN 312000 313000 NSNS 321110 321120 321130 OHL 321200 321310 OHM 321320 321330 OHT 322200 324000 327100 234200 234200 234200 231130 321120 321130 321120 321130 321200 321310 32130 321310 32130 321310 321320 321330 321330 321330 321330 321330 321330 321330 321330 321330 321330 321330 321330 321330

Table V.2 (cont.)

NAME	CBS NUMBER	NAME	CBS NUMBER
PMG(I)	210000	RIM	327200
PO	311000	RO	311000
PSOS	312000	RPL	321310
PSS(I)	222000	RPM	321320
PTE(I)	223000	RSD	3.21130
PTI(I)	235400	RSL	323100
PTM(1)	235200	RSU	321110 321120 322100
PTO(I)	235100	RSR	
PTP(I)	235300		321330
R(K)	232110 321120 321130 321200 321310 321320 321330 327100 232110 321110 321120 321130 321200 321310 321320	RSS(K) RW(K) STE(I) STEM STES TERM	232110 321120 321130 321310 321320 321330 321330 231000 232120 232120 324000 330000
RAM	321330 327100 328100	W(K)	321310 321320 321330
	328200	Y	ALL
RAP	328300		
RDM	326000		
RIE	232200		

Table V.2 (cont.)

E. Sensitivity Analysis Card

Variables to be sensitized are noted on the sensitivity analysis card. These cards are identified by punching SA in columns 1 and 2.

The mnemonic of the variable to be sensitized is entered in columns 10 through 17. The lower and upper values of the range over which the variable is to be sensitized are entered in columns 20 through 29 and 30 through 39 respectively.

Up to ten scalar variables and up to ten array variables may be sensitized in a given program execution.

The sensitivity analysis for a scalar begins by setting the variable to the lower range value, performing the model calculations, and printing a line of output.

The process is repeated ten times successively adding 1/10 of the range to the variable's value.

The sensitivity analysis for an array variable begins by multiplying all original elements of the array by a multiplier initially set equal to the lower range value, performing the model calculations, and printing a line of output. The process is repeated ten times successively adding 1/10 of the range to the multiplier. Array elements are subsequently printed giving the original and eleven modified values of each element.

If more than ten scalars or ten arrays are used

for sensitivity analysis, the excess will be ignored and a warning message issued for each.

VI. FLEX TECHNIQUE IN LCC METHODOLOGY

FLEX option of the NAVMAT Equipment LCC Model provides the analyst the flexibility to modify the standard LCC model to his specific project needs. It is realized that within the limits of the standard LCC model it is not feasible to cover a wide range of possible unique situations of every project. With this in mind, the FLEX technique is introduced. Using this technique, the analyst can modify the standard LCC model to the extent of even redefining the entire cost structure. However, this is neither intended nor recommended. The user should stay within the same framework of the standard cost model and add or delete cost elements, define and use new variables, or make use of other miscellaneous options provided by the flex technique to emphasize certain cost areas or make some changes in the cost calculation methodology that is more fitting to his specific project. Run Deck sequence of the computer program is shown in Figure V.l. A flex technique sample computer run is provided in Appendix E. The basic optional changes of the flex technique are as follows:

A. Revision, Addition, Or Deletion Of Cost Elements
Revision, addition, or deletion of a cost element
is done by providing a "CS" card in the "CS" file (refer

to figure V.1). The format of a "CS" card is as follows:

Column(s)	Description
1-2	Card type "CS"
3-8	Cost Breakdown Structure number
9-10	Not used
11-50	Cost element description
51-54	Not used
55 ~ 56	Cost category
57-59	Not used
[^] 60	Funding type
61-64	Not used
65	Inflation factor type
66-69	Not used
70	Equation code
71-79	Not used
80	Deletion code

Code numbers of cost categories, funding types, and inflation factor types are provided in section II.

1. Revision

If the analyst wants to maintain the cost element but make changes in the description, cost category, funding type, or inflation factor type, he must prepare a "CS" card and identify the cost breakdown structure number and modify only the changes to be implemented.

2. Addition

If the user is introducing a new cost element, he should prepare a "CS" card, and by using the standard LCC model as a reference, define a cost breakdown structure number. If the cost element is not the lowest indenture level, a cost breakdown structure number and description of the cost element is all that is needed. However, if the cost element

is at the lowest indenture level, then the analyst must provide the information associated with the cost category, funding type, inflation factor type and also indicate that an equation card will follow the "CS" card (Lowest indenture level cost elements <u>must have equations</u>). The computer program is dimensioned to accept 100 new cost elements.

3. Deletion

If the analyst wants to delete a cost element, he prepares a CS card, defines the cost breakdown structure number and punches 1 in the 80th column. Caution: This will delete the cost element specified and also all the lower indenture level cost elements below it. The analyst may use the deleted cost structure numbers for new cost element definitions. Note: If a standard LCC model cost factor is deleted thru deletion of cost elements not being used again, it may be excluded from the NAMELIST data.

B. Equations For Cost Elements

Equations are identified with an "EQ" card provided in the same file with "CS" cards. Equations may be provided to modify the existing equations or for new cost elements. In either case, an "EQ" card must follow a "CS" card with the same cost breakdown structure number. Equation card format is as follows:

Column(s)	Description
1-2	Card type "EQ"
3-8	Cost breakdown structure number
9-10	Not used
11-80	Cost equation

Equations may be continued to another card by breaking off at a comma or semicolon and resuming in the next card. A continuation card must be an "EQ" card and must be identified by the same cost breakdown structure number.

Equations are written in Reversed Polish notation in which each operation (+ , - , * , / , **) acts on the two quantities immediately preceding it, working from left to right (many electronic calculators use this technique).

Thus A,B,C,+,* represents (B+C)*A. Equation elements are separated by commas. Summation is indicated by the semicolon. The sequence is "subscript, minimum value, maximum value". The subscript "I" always denotes the year and is treated differently. Those years outside the range of "I" are assigned a cost of zero while those within the range are assigned the cost obtained by fixing the value of "I" appropriately and summing over the other subscripts. Samples of equations written in Reversed Polish Notation are:

1.

Same as,

2.

$$A(I),B,+,C(J),*,D,E,**,-,F,/;I,1,Y,J,1,N$$

Same as,

C. New Variables

In new equations, the analyst has the option to use the built-in cost factors defined for the standard cost model or define, describe, and use values for new variables thru the "NV" file (refer to Figure V.1). The computer program is dimensioned to accept 50 new scalars and 50 new arrays. The analyst may use internally defined dimensioning scalars for the new arrays. However, if the analyst defines the dimensioning scalars, they must be read in before any of the arrays dimensioned by it.

1. Variable Description Card

This card is optionally used to describe the user input variables. If one card is not enough, the description of the variable is continued on the next card. A maximum of two cards can be used for each variable. The format of both cards are identical. If two cards are used, they must be consecutive in the "NV" file. "DS" cards may appear anywhere in the file as long as they do not seperate an "NV" card from its continuation. The format of a "DS" card is as follows:

Column(s)	Description	
1-2	Card type "DS"	
3-4	Not used	
5-15	Variable name	
16-72	Variable description	
73-80	Not used	

Variable name and value input card ("NV" Card)

Whenever a new variable is used, it must be defined and its value must be used by an "NV" card. An "NV" card may appear anywhere in the "NV" file as long as it does not separate another "NV" card from its continuation. An "NV" card may be continued to another "NV" card by breaking off at a comma (comma signifies the continuation of the card) and resuming on the next "NV" card identified by the same variable name. Variable values are used the same way as in the NAMELIST data input procedures as described in Section V. The format of the "NV" file is as follow:

Column(s)	Description	
1-2	Card type "NV"	
3-4	Not used	
5-15	Variable name	
16-80	Variable value	

D. Other FLEX Options

1. Cost Categories

The standard LCC cost model provides 10 defaulted cost categories. However, the analyst may vary the number of cost categories from one to twenty, and define the cost

category names at his option. These variables must be used thru the NAMELIST data as shown below:

NOCAT- The number of cost categories (Integer) e.g., NOCAT=11,

CAT1, CAT2,....CAT20- The variables that define the cost category names. The first ten default to the names in the standard LCC cost categories. These variables must be entered in quotes in blocks of maximum 8 characters:

CAT8='FACILITI','ES',

CAT11='MANAGEME','NT',

Cost Elements (Cost elements defined in the summary report)

The standard LCC model defaults to three cost elements in the summary report. However, the analyst may vary this by changing the LCC model cost breakdown structure definition. The first number of the cost breakdown structure number determines the number of cost elements in the summary report. Using the FLEX technique the analyst may vary this number from one to six. The reporting format of the computer program automatically adjusts to the changes. The analyst may also change the title of the cost elements in the summary report by using the following variables which must be input thru NAMELIST data:

ELT1, ELT2,....ELT6- Cost element titles. The first three default to DEVELOPMENT, INVESTMENT, and O&S. These

variables must be entered in quotes with a maximum of 8 characters:

ELT4='OPERATIO','NS',

3. Funding type (Titles for the Funding reports)

The number of funding types are fixed to six.

However, the analyst may change the title of the funding type by providing the following variables thru NAMELIST data:

FUND1, FUND2,......FUND6- Funding titles default to R&D, PROCUREMENT, CONSTRUCTION, O&M, MILITARY, OTHERS.

They must be entered in quotes with a maximum of eight characters (e.g. FUND6='SUNK COS', 'T',).

4. Years

Life cycle cost years are automatically generated in the program from 1 to total number of years 'Y'.

However, the analyst may provide alpha-numeric presentation of the years by providing values for the variable 'YEARS' thru NAMELIST data:

Years are read in quotes in block of four characters (e.g. YEARS='BY94', 'FY95', '1996',)

APPENDIX A

NAVMAT EQUIPMENT LCC MODEL EQUATIONS

TOTAL LIFE CYCLE COST is equal to the sum of the following basic equations

RESEARCH AND DEVELOPMENT COSTS

CBS 111000

Contractor payments paid by the government for the equipment development effort during the R&D Validation Phase are

Y S ADC(I) I=1

Where;

I Designator for a specific project year

Y Number of years covered by the life cycle cost analysis ADC(I) Contractor payments (\$/yr)

CBS 112000

Government expenditures for the equipment development effort during the R&D Validation Phase are

Y
S ADG(I)
I=1

Where

ADG(I) Government expenditures (\$/yr)

CBS 121100

Contractor Management costs during full scale development effort are

Y S DCPM(I) I=1

Where

DCPM(I) Contractor Management costs (\$/yr)

Contractor Engineering costs during full scale development effort is

Y S DCE(I) I=1

Where

DCE(I) Contractor Engineering costs (\$/yr)

CBS 121300

Contractor prototype hardware development costs during full scale development effort are

Y S DCH(I) I=1

Where

DCH(I) Contractor prototype hardware costs (\$/yr)

CBS 121400

Contractor software development costs during full scale development effort are

Y S DCS(I) I=1

Where

DCS(I) Contractor Software development costs (\$/yr)

Contractor development Test & Evaluation costs during full scale development effort is

Y S DCTE(I) I=1

Where

DCTE(I) Contractor development Test & Evaluation costs (\$/yr)

CBS 121600

Contractor Documentation costs during full scale development effort are

Y S DCD(I) I=1

Where

DCD(I) Contractor Documentation costs (\$/yr)

CBS 121700

Contractor Support & Test equipment development costs during full scale development effort are

Y S DCST(I) I=1

Where

. DCST(I) Contractor S&TE development costs (\$/yr)

I=1

Government Program Management costs during full scale development effort are

Y S DGPM(I)

Where

DGPM(I) Program Management costs (\$/yr)

CBS 122210

Training costs incurred by students during Test & Evaluation maintenance program are

Y S DGTT(I) I=1

Where

DGTT(I) Training costs (\$/yr)

CBS 122220

Test Site activation/deactivation costs incurred by Government during full scale development Test & Evaluation program are

Y
S DGTA(I)
I=1

Where

DGTA(I) Test Site activation/deactivation costs (\$/yr)

CBS 122230

Test & Evaluation costs incurred by Government during full scale development Test & Evaluation Program are

Y S DGTE(I) I=1

Where

DGTE(I) Test & Evaluation personnel costs (\$/yr)

```
INVESTMENT COSTS
```

Government Program Management cost is

Y § PMG(I) I=1

Where

PMG(I) Program Management costs (\$/yr)

CBS 221000

Production hardware costs of the Prime Equipment are

Y S NN(I) * CU I=1

Where

NN(I) Prime equipment annual acceptance schedule (equip./yr) CU Prime equipment procurement price (\$/equip.)

CBS 222000

Production Support & Services costs of the prime equipment are

Y § PSS(I)

I=1 Where

PSS(I) Production Support & Services costs (\$/yr)

CBS 223000

Production Test & Evaluation costs of the prime equipment are

Y S PTE(I)

I=1 Where

PTE(I) Production Test & Evaluation costs (\$/yr)

Transportation to installation site expenditures to cover the cost of moving the prime equipment from the contractors facility to the point of installation are

Y
S NN(I) * CTPE
I=1

Where

NN(I) Prime equipment annual acceptance schedule (equip/yr) CTPE Transportation costs (\$/equip)

CBS 225000

Installation costs for the Prime Equipment are

Y
S NN(I) * CIPE
I=1

Where

NN(I) Prime equipment annual acceptance schedule (equip/yr) CIPE Installation costs (\$/equip)

CBS 231000

Acquisition costs of Support & Test equipment are

Y \$ STE(I) I=1

Where

STE(I) Support & Test equipment acquisition costs (\$/yr)

```
CBS 232110
Acquisition cost of Primary equipment Initial Spares is
     NN(I) * S OT*DC(K)*QTY(K)*CST(K)*[DSC(K)*(FPST+FILS) +
   S
              K=1
  I=1
                  [1-DSC(K)]*[RSS(K)*FIRT+[1-RSS(K)]*FDRT]] /
                                            [R(K)*FR(I)*365]
Where
            Prime equipment annual acceptance schedule (equip/yr)
  NN(I)
  OT
            Prime equipment annual operating time (hrs/equip/year)
            Duty cycle of Kth item (ratio)
   DC(K)
            Quantity of Kth item
                                   (quantity/item)
  QTY(K)
  CST(K)
            Unit cost of the Kth item ($/item)
   DSC(K)
            Discard rate of Kth item (ratio)
            Procurement lead & safety stockage time for spares (days
   FPST
            Reguired stockage time at O/I level for spares (days)
   FILS
   RSS(K)
            Repair level ratio (ratio)
            Required stockage time for O/I repairable items
   FIRT
            Required stockage time for depot repairable items (days)
   FDRT
            Mean time between failures for Kth item (hrs/failure)
   R(K)
   FR(I)
            Reliability improvement/degradation factor (factor)
   K
            Designator for a specific spare/repair item
   NK
            The number of spare/repair items in an equipment
```

Acquisition cost of Support & Test Equipment Initial Spares is

Where

STE(I) Support & Test equipment acquisition costs (\$/yr)
STEM Material support rate . Percent of S&TE cost (ratio)

Introduction of new NSN's (National Stock Number) into the supply system costs are

IYI

§ (NSNP + NSNS) * RIE
I=IYI

Where

NSNP Number of new NSN's of Primary Equipment (NSN)

NSNS Number of new NSN's of Support & Test Equipment (NSN)

RIE Average NSN entry into the supply system cost (\$/NSN)

CBS 233100

Facility costs incurred by the Government to construct/prepare the operational sites are

Y S FOS(I) I=1

Where

FOS(I) Operational site const/prep. costs (\$/yr)

CBS 233200

Facility costs incurred by the government to construct/prepare maintenance sites are

Y S FMS(I) I=1

Where

FMS(I) Maintenance site constr/prep. costs (\$/yr)

CBS 234100

Acquisition costs of Technical Data not included in the development costs are

Y S AD(I) I=1

Where

AD(I) Technical Data Acquisition costs (\$/yr)

Reproduction and Distribution costs of Technical Data are

Y S NC(I) * NP * CP I=1

Where

NC(I) Number of copies (copies/yr)

NP Number of pages in a set of technical data (pages)
CP Reproduction and distribution costs (\$/page/copy)

CBS 235100

Operating personnel pay, allowance, travel costs, and course fees incurred during the initial operator training course are

Y § PTO(I) * CTO I=1

Where

PTO(I) Number of students (students/yr)
CTO Operating personnel training cost (\$/student)

CBS 235200

O/I level maintenance personnel pay, allowance, travel costs, and course fees incurred during the initial training course are

Where

PTM(I) Number of students (students/yr)
CTM O/I Maintenance personnel training cost (\$/student)

Depot level maintenance personnel pay, allowance, travel costs, and course fees incurred during the initial training course are

Where

PTP(I) Number of students (students/yr)
CTP Depot Maintenance personnel training cost (\$/student)

CBS 235400

Instructor training personnel pay, allowance, travel costs, and course fees incurred during the initial training course are

Where

PTI(I) Number of students (students/yr)
CTI Instructor training cost (\$/student)

CBS 235500

Acquisition and installation costs of training aids of the initial training program are

Y S ATU(I) I=1

Where

ATU(I) Acquisition and installation costs of training aids (\$)

OPERATING AND SUPPORT COST

CBS311000

Personnel pay and allowance costs incurred by the equipment operators are

Where

N(I) Prime equipment inventory (equip/yr)

PO Number of operators per prime equipment (operator/equip)

RO Operator hourly pay rate (\$/hr/operator)

OT Prime Equipment operating time (hrs/equip/yr)

CBS 312000

Facility space costs for providing necessary operational area for the equipment are

Where

N(I) Prime equipment inventory (equip/yr)

PSOS Operational area per prime equipment (sq.ft./equip)

CSO Operational area space cost (\$/sq.ft./yr)

CBS 313000

Energy cost incurred during the equipment operation is

Where

N(I) Prime equipment inventory (equip/yr)

CE Energy cost (\$/hrs/equip)

OT Prime Equipment operating time (hrs/equip/yr)

Material costs incurred during the equipment operation are

Y S N(I) * CM * OT I=1

Where

N(I) Prime equipment inventory (equip/yr)

CM Material cost (\$/hr/equip)

OT Prime equipment operating time (hrs/equip/yr)

CBS 315000

Software maintenance costs incurred during the equipment operation are

Y S CS(I) I=1

Where

CS(I) Prime equipment software maintenance costs (\$/yr)

CBS 321110

O/I level Corrective Maintenance Labor costs for the detection, isolation, removal and replacement of item failures in the prime equipment are

Y NK
S N(I) * S OT*DC(K)*QTY(K)*LSO(K)*RSL / [R(K)*FR(I)]
I=1 K=1

Where

N(I) Prime equipment inventory (equip/yr)

OT Prime equipment operating time (hrs/equip/yr)

DC(K) Duty cycle of Kth item (ratio)

QTY(K) Quantity of Kth item (quantity/item)

LSO(K) O/I maintenance time to remove, replace Kth item (hrs/item)

RSL O/I maintenance personnel pay rate (\$/hr)

R(K) Mean time between failures for Kth item (hrs/failure)

FR(I) Reliability improvement/degradation factor (factor)

```
CBS 321120
O/I level Corrective Maintenance Labor costs incurred during the
repair of a failed item are
               NK
      SN(I) * SOT*DC(K)*QTY(K)*LSI(K)*RSL*RSS(K)[1-DSC(K)] /
     I=1
              K=1
                                              [R(K)*FR(I)]
Where
    N(I)
             Prime equipment inventory (equip/yr)
    OT
             Prime equipment operating time (hrs/equip/yr)
    DC(K)
             Duty cycle of Kth item (ratio)
             Quantity of Kth item
    QTY(K)
                                    (quantity/item)
    LSI(K)
             O/I maintenance time to repair the Kth item (hrs/item)
    RSL
             O/I maintenance personnel pay rate ($/hr)
    RSS(K)
             Repair level ratio (ratio)
    DSC(K)
             Discard rate of Kth item (ratio)
    R(K)
             Mean time between failures of Kth item (hrs/failure)
    FR(I)
             Reliability improvement/degradation factor (factor)
CBS 321130
Depot level Corrective Maintenance costs incurred during the repair
of a failed item are
      Y
               NK
      $ N(I) * $ OT*DC(K)*QTY(K)*LSD(K)*RSD*[1-RSS(K)]*
     I=1
              K=1
                                   [1-DSC(K)] / [R(K)*FR(I)]
Where
    N(I)
             Prime equipment inventory (equip/yr)
    OT
             Prime equipment operating time (hrs/equip/yr)
    DC(K)
             Duty cycle of Kth item (ratio)
```

Quantity of Kth item (quantity/item)

Repair level ratio (ratio)

Discard rate of Kth item (ratio)

Depot maintenance time to repair Kth item (hrs/item)

Mean time between failures of Kth item (hrs/failure)

Reliability improvement/degradation factor (factor)

Depot maintenance personnel pay rate (\$/hr)

QTY(K)

LSD(K) RSD

RSS(K)

DSC(K) R(K)

FR(I)

```
CBS 321200
  Corrective Maintenance Repair Material costs are
      N(I)* S OT*DC(K)*QTY(K)*CST(K)*FM*[1-DSC(K)] / [R(K)*FR(I)]
    S
   I=1
            K=1
Where
    N(I)
             Prime equipment inventory (equip/yr)
             Prime equipment operating time (hrs/equip/yr)
    OT
    DC(K)
             Duty cycle of Kth item (ratio)
    QTY(K)
             Quantity of Kth item (quantity/item)
    CST(K)
             Unit cost of the Kth item ($/item)
             Repair material rate. Percent of item cost (ratio)
    FM
    DSC(K)
             Discard rate of Kth item (ratio)
             Mean time between failures of Kth item (hrs/failure)
    R(K)
             Reliability improvement/degradation factor
    FR(I)
```

Packaging Labor costs incurred during the process of shipping failed items between the intermediate and depot level maintenance facilities are

```
Y NK

$ N(I)* $ OT*DC(K)*QTY(K)*2*W(K)*RPL*[1-RSS(K)] *

I=1 K=1 [1-DSC(K)] / [R(K)*FR(I)]
```

Prime equipment inventory

Where

N(I)

** \ - /	
OT	Prime equipment operating time (hrs/equip/yr)
DC(K)	Duty cycle of Kth item (ratio)
QTY(K)	Quantity of Kth item (quantity/item)
W(K)	Weight of Kth item (#)
RPL	Packaging labor cost (\$/#)
RSS(K)	Repair level ratio (ratio)
DSC(K)	Discard rate of Kth item (ratio)
R(K)	Mean time between failures of Kth item (hrs/failure)
FR(I)	Reliability improvement/degradation factor (factor)

(equip/vr)

```
CBS 321320
```

Packaging Material cost incurred during the process of shipping failed items between the intermediate and depot level maintenance facilities are

```
Y NK
S N(I)*S OT*DC(K)*QTY(K)*2*W(K)*RPM*[1-RSS(K)] *
I=1 K=1
[1-DSC(K)] / [R(K)*FR(I)]
```

Where

N(I) Prime equipment inventory (equip/yr)
OT Prime equipment operating time (hrs/equip/yr)

DC(K) Duty cycle of Kth item (ratio)

QTY(K) Quantity of Kth item (quantity/item)

W(K) Weight of Kth item (#)

RPM Packaging material cost (\$/#)

RSS(K) Repair level ratio (ratio)

R(K) Mean time between failures of Kth item (hrs/failure)

FR(I) Reliability improvement/degradation factor (factor)

CBS 321330

Shipping cost incurred during the transportation of failed items between the intermediate and depot level maintenance facilities are

Where

N(I) Prime equipment inventory (equip/yr)

OT Prime equipment operating time (hrs/equip/yr)

DC(K) Duty cycle of Kth item (ratio)

QTY(K) Quantity of Kth item (quantity/item)

W(K) Weight of Kth item (#)

RSR Shipping cost (\$/#)

RW(K) Item packing weight ratio (shipping Wt/unpacked Wt)

RSS(K) Repair level ratio (ratio)

DSC(K) Discard rate of Kth item (ratio)

R(K) Mean time between failures of Kth item (hrs/failure)

FR(I) Reliability improvement/degradation factor (factor)

```
CBS 322100
Preventive Maintenance Labor costs are
             NM
   S N(I) * S OT * LPM(N) * RSL / NPM(N)
  I=1
            N=1
Where
  N(I)
           Prime equipment inventory (equip/yr)
           Prime equipment operating time (hrs/equip/yr)
  OT
  LPM(N)
           Maintenance time of Nth type PM action (hrs/equip/action)
  RSL
           O/I maintenance personnel pay rate ($/hr)
           Time between inspections of Nth type PM (hrs/action)
  NPM(N)
  N
           Designator for a specific preventive maintenance type
  NM
           Number of preventive maintenance types
CBS 322200
Preventive Maintenance Material costs are
             NM
   S N(I) * S OT * MPM(N) / NPM(N)
  I=1
            N=1
Where
  N(I)
           Prime equipment inventory (equip/yr)
  OT
           Prime equipment operating time (hrs/equip/yr)
```

Material cost of Nth type PM action (\$/equip/action)

Time between inspections of Nth type PM (hrs/action)

Designator of a specific preventive maintenance type

CBS 323100 Prime equipment Overhaul Maintenance Labor costs are γ

Number of preventive maintenance types

Y S NOH(I) * OHL * RSD I=1

Where

MPM(N) NPM(N)

N

NM

NOH(I) Prime equipment overhaul schedule (equip/yr)
OHL Overhaul maintenance time (hrs/equip)
RSD Depot maintenance pay rate (\$/hr)

Prime equipment Overhaul Maintenance Material costs are

Y S NOH(I) * OHM I=1

Where

NOH(I) Prime equipment overhaul Schedule (equip/yr)
OHM Overhaul maintenance material cost (\$/equip)

CBS 323300

Transportation of material costs for shipping equipment and other items during Prime equipment overhaul are

Y S NOH(I) * OHT I=1

Where

NOH(I) Prime equipment overhaul schedule (equip/yr)
OHT Material shipping rate (\$/equip)

CBS 324000

Support & Test Equipment Maintenance Labor and Material costs are

Y S N(I) * STES I=1

Where

N(I) Prime equipment inventory (equip/yr)

STES Recurring support cost of S&TE (\$/prime equip)

```
CBS 325110
O/I level maintenance shop space costs are
   Y
   $ MSSI(I) * CSI
  I=1
Where
   MSSI(I)
             O/I maintenance shop space (sq. ft./yr)
             O/I maintenance space cost ($/sq. ft.)
CBS 325120
Depot level maintenance shop space costs are
   Y
   $ MSSD(I) * CSD
  I=1
Where
   MSSD(I)
             Depot maintenance shop space (sq. ft/yr)
   CSD
             Depot maintenance space cost ($/sq. ft.)
CBS 325210
O/I level maintenance material storage costs are
   S ISSI(I) * CSI
  I=1
Where
             O/I maintenance material storage space (sq. ft./yr)
   ISSI(I)
             O/I maintenance space cost ($/sq. ft.)
   CSI
CBS 325220
Depot level maintenance material storage costs are
   § ISSD(I) * CSD
  I=1
Where
   ISSD(I)
             Depot maintenance material storage space (sq. ft./yr)
   CSD
             Depot maintenance space cost ($/sq. ft.)
```

```
CBS 326000
  Technical data maintenance costs for managing the technical data
  distribution center are
     S NP * RDM
   I=IYI
  Where
           Number of pages in a set of technical data
     NP
     RDM
           Technical data management costs
     IYI
           Initial year
  CBS 327100
  Corrective Maintenance Replenishment Spares costs are
     \S N(I)* \S OT*DC(K)*QTY(K)*CST(K)*DSC(K) / [R(K)*FR(I)]
    I=1
            K=1
Where
    N(I)
             Prime equipment inventory (equip/yr)
             Prime equipment operating time (hrs/equip/yr)
    OT
             duty cycle of Kth item (ratio)
    DC(K)
             Quantity of Kth item (quantity/item)
    QTY(K)
             Unit cost of the Kth item
    CST(K)
                                       ($/item)
             Discard rate of Kth item
    DSC(K)
                                        (ratio)
             Mean time between failures of Kth item (hrs/failure)
    R(K)
    FR(I)
             Reliability improvement/degradation factor (factor)
  CBS 327200
  Supply support management costs are
     S
       [NSNP + NSNS] * RIM
   I=IYI
  Where
           Number of new NSNs for prime equipment (NSN)
     NSNP
```

Number of new NSNs for S&TE equipment (NSN)

Supply support management costs (\$/NSN)

NSNS RIM

Initial year

IYI

Operator course pay and allowance costs incurred by students during training period are

Y S LO(I) * RAM * CTO I=1

Where

LO(I) Manning level of operating personnel (personnel/yr)

RAM Personnel attrition rate (ratio)

CTO Operator training cost (\$/student)

CBS 328200

O/I level maintenance personnel pay and allowance costs incurred by students during training period are

Y S LM(I) * RAM * CTM I=1

Where

LM(I) Manning level of O/I maintenance personnel (personnel/yr)

RAM Personnel attrition rate (ratio)

CTM O/I maintenance personnel training cost (\$/student)

CBS 328300

Depot level maintenance personnel pay and allowance costs incurred by students during training period are

Y S LP(I) * RAP * CTP I=1

Where

LP(I) Manning level of Depot maintenance personnel (personnel/yr)

RAP Personnel attrition rate (ratio)

CTP Depot maintenance personnel training cost (\$/student)

Termination cost/value of the Prime equipment is

Y S NPO(I) * TERM I=1

Where

NPO(I) Prime equipment phase out schedule (equip/yr)
TERM Prime equipment net terminal cost/value (\$/equip)

APPENDIX B

Life Cycle Cost factor

Names, Descriptions, Dimensions, and Sources

Life Cycle Cost Factors Names, Descriptions, Dimensions and Sources

The material in this appendix contains a listing of the 104 Cost Factors used in the NAVMAT LCC Model. Names, Descriptions, Dimensions and the source of information have been identified for all the Cost Factors. These major sources are:

- 1. Program Management Office (PMO)
- Program Manager for Logistics (PM(L)) and/or his/her
 Logistic Managers
- 3. The Contractor
- 4. Analyst

the same of the sa	
Name Description Dimension Source	AD(I) Acquisition cost of data during Investment in year I. This refers to acquiring, writing, assembling, reformating technical manuals and other documentation not covered during Research & Development phase. \$/year PMO
Name Description	ADC(I) Government payments to the contractor for technical and managerial work performed during the Validation phase of the Research & Development in year I.
Dimension Source	\$/year PMO
Name	ADG(I)
Description	Government expenditures for technical and managerial work performed during the Validation phase of the
Dimension Source	Research & Development in year I. \$/year PMO
Name	ATU(I)
Description	Acquisition, transportation, and installation costs of training aids and devices to conduct operator, maintenance personnel, and instructor training courses during initial training program in year I.
Dimension Source	\$/year PM(L)

Name Description	BY Base year during/from which all cost adjustments are made.
Dimension Source	Dimensionless PMO

Name Description Energy consumption cost incurred during the operation of the prime equipment. \$/hr/equip Dimension Source PM(L) & Contractor Name CIPE Description Installation cost of the prime equipment (If not covered by the acquisition cost). This cost refers to the material and services involved in assembling the equipment and complete checkout to assure achievement of operational status. Dimension \$/equip Source PM(L) Name Cost of materials consumed during the operation of the Description prime equipment. Dimension \$/hr/equip Source PM(L) & contractor Name CP Average cost per page of set-up, reproduction, and Description distribution of technical manuals. Dimension \$/page/copy Source PM(L) CS(I) Description Software maintenance cost during prime equipment operation in year I. Dimension \$/year Source PM(L)

Dimension	CSD Area cost for depot level maintenance space \$/sq.ft./year PM(L)
	CSI Area cost for O/I level maintenance space \$/sq.ft./year PM(L)
	CSO Area cost for Operational space. \$/sq.ft./year PM(L)
Name Description Dimension Source	<pre>CST(K) Unit cost of the Kth spare/repair item. \$/item PM(L)</pre>
Name Description Dimension Source	CTI Average cost incurred during instructor training course for personnel pay & allowance, travel, and course fees. \$/student PM(L)
Name Description Dimension Source	CTM Average cost incurred during O/I maintenance personnel training course for personnel pay & allowance, travel and course fees. \$/student PM(L)

Name Description Average cost incurred during operating personnel training course for personnel.pay & allowance, travel, and course fees. Dimension \$/student Source PM(L) CTP Name Description Average cost incurred during depot maintenance personnel training course for personnel pay & allowance travel, and course fees. Dimension \$/student Sourse PM(L) CTPE Name Description Transportation cost of prime equipment from contractors facility to installation site (if not included in acquisition cost). This includes the packaging and transportation of the prime equipment from the contractors facility to the first destination, and then to the second destination (operation site). \$/equip Dimension Source PM(L) Name Description Unit price of the prime equipment. In addition to the prime equipment hardware this cost may include part or all of production support and services costs, and transportation and installation cost of the equipment. (These costs should be identified properly to avoid double counting). Dimension \$/equip Source PMO Name DC(K) Duty cycle of the Kth spare/repair item. Percent of Description prime equipment operating time. Dimension Ratio (Item operating time/Equip. operating time) Source PM(L) & Contractor

Name

DCD(I)

Description

Payment by the Government to the Contractor for all the deliverable data acquired during full scale development in year I. The data requirement will normally be selected from the departmental or agency authorized data list. It includes the effort for acquiring, writing, assembling, reformating, production, packaging and shipping Engineering data, Support data, and Management data required by the government.

Dimension Source \$/year PMO

Name

DCE(I)

Description

Payments by the Government to the Contractor for the engineering efforts during full scale development in year I. This includes all engineering efforts associated with the equipment design and development. Specifically, the cost of system engineering, and integration, design engineering, design support engineering, and engineering planning costs. It includes the cost of direct labor, material, overhead, and other direct costs incurred during the engineering process.

Dimension Source \$/year

Name Description DCH(I)

Payments by the Government to the Contractor for the hardware development efforts during full scale development in year I. This includes the fabrication and assembly of full scale development models in support of the engineering design activity. This includes the cost of direct labor, materials and overhead associated with material procurement and handling, tooling and test equipment in support of manufacturing, fabrication, assembly, system integration, and

Dimension Source \$/year PMO

checkout.

Name DCPM(I) Description Payment by the Government to the Contractor for the Management effort during full scale development in year I. This refers to the costs incurred for planning, organizing, manning, directing, and controlling the technical and administrative activities of the project. This includes the cost of personnel, services, and overhead associated with cost/schedule control, configuration management, data management, contract management, and ILS (Integrated logistic support) management. Dimension \$/year Source PMO DCS(I) Name Payment by the Government to the Contractor for Description software development effort for the prime equipment during full scale development in year I. This includes the cost of direct labor, material, overhead, and other direct costs associated with the computer software development. Dimension \$/year Source PMO DCST(I) Name Description Payment by the Government to the Contractor for the development of the Peculiar Support and Test equipment during full scale development in year I. This refers to all costs inclusive of the software costs associated with Peculiar Support & Test equipment. Dimension \$/year

PMO

Source

Name Description

DCTE(I)

Payment by the Government to the Contractor Test & Evaluation efforts during full scale development in year I. This refers to the costs which are incurred in support of the government testing (DTE and IOTE) during the full scale development phase of the equipment life cycle. This cost factor may include for example: spares, repair parts, support & test equipment, training, test site activation, facility requirements, and services.

Development test and evaluation (DTE) support is designed to determine and/or verify technical performance and safety characteristics of an item, associated tools and test equipment. It includes determination of structural, mechanical, electrical, chemical and other physical properties of the equipment. DTE is generally conducted in contractors facilities.

Initial operational test and evaluation (IOTE) support refers to the operational test and evaluation performed during the full scale development prior to the production decision to provide information as to the equipment military use expected operational effectiveness and operational suitability, maintenance concepts, training needs and technical manual suitability. IOTE is generally conducted at Government facilities.

Dimension Source

\$/year PMO

Name Description

DGPM(I)

Government project management costs incurred during full scale development in year I. This refers to the technical and administrative planning, organizing, directing, coordinating, controlling, and approval actions designed to accomplish overall program objectives. Examples of these activities are configuration management, cost/schedule management, data management, contract management, and integrated logistic support management.

Dimension Source

\$/year
PMO

DGTA(I) Name Description Government costs for test site activation/deactivation during full scale development Test & Evaluation program in year I. This refers to the costs for test site modification, transportation and installation of the prototype models at the test site, test site operation, restoration and facilities leased or government facilities used during Test & Evaluation program. Dimension \$/year PMO Source DGTE(I) Name Description Government personnel costs incurred during full scale development Test & Evaluation program for testing and evaluation. Dimension \$/year Source PMO Name DGTT(I) Government costs to train students during full scale Description development Test & Evaluation program in year I. This refers to the pay & allowance and travel expenses and the course fees and the training facilities provided by the government. Dimension \$/year PMO Source Name DR(I) Annual discount rate for future costs in year I. Description Dimension Ratio PMO & Analyst Source Name DSC(K) Discard rate of the Kth spare/repair item. Description Dimension Ratio

PM(L) & Contractor

Source

Name Description Dimension Source	FDRT Required stockage time for depot level repairable items at O/I and depot level. Days PM(L)
Name Description Dimension Source	FILS Required stockage time for replenishment spares at O/I level. Days PM(L)
Name Description Dimension Source	FIRT Repair cycle time of repairable items at O/I level. Days PM(L)
Name Description Dimension Source	FM Repair material rate. Ratio - (Repair material cost/Item unit cost) PM(L)
Name Description Dimension Source	FMS(I) Maintenance site construction/preparation costs during Investment period in year I. \$/year PMO
Name Description Dimension Source	FOS(I) Operational site construction/preparation costs during Investment period in year I. \$/year PMO

Name Description Dimension Source	FPST Procurement lead and safety level stockage time for initial spare & repair parts. Days PM(L)
Name Description Dimension Source	FR(I) Reliability improvement or degradation factor during year I. Dimensionless PM(L)
Name Description Dimension Source	IRCON(I) Annual inflation rate for future costs for construction type of funding during year I. Ratio Analyst
Name Description Dimension Source	IROM(I) Annual inflation rate for future costs of O&M type of funding during year I. Ratio Analyst
Name Description Dimension Source	IRPROC(I) Annual inflation rate for future costs of procurement type of funding during year I. Ratio Analyst
Name Description Dimension Source	IRRD(I) Annual inflation rate for future costs of R&D type of funding during year I. Ratio Analyst

Name ISSD(I) Description Storage space required for the depot inventory during year I. Dimension sq.ft./year Source PM(L) & Contractor Name ISSI(I) Storage space required for the O/I inventory Description during year I. sq.ft./year Dimension Source PM(L) & Contractor Name IYI Year I during which initial cost occur. Description Dimension Dimensionless Source PMO Name LO(I) Desired manning level for operating personnel Description during year I. Dimension Personnel/year Source PM(L) & Contractor Name LM(I) Description Desired manning level for O/I level maintenance personnel during year I. Dimension Personnel/year Source PM(L) & Contractor Name LP(I) Description Desired manning level for depot level maintenance personnel during year I. Dimension Personnel/year Source PM(L) & Contractor

LPM(N) Preventive maintenance labor time for the Nth Description type of maintenance action. hrs/action Dimension PM(L) & Contractor Source LSD(K) Name Depot maintenance labor time to repair the Kth Description item. hrs/item Dimension Source PM(L) & Contractor LSI(K) Name O/I maintenance labor time to repair the Kth Description item. Dimension hrs/item PM(L) & Contractor Source Name LSO(K) O/I maintenance labor time to remove, replace the Description Kth item. Dimension hrs/item Source PM(L) & Contractor Name MPM(N) Material cost for the Nth type of preventive Description maintenance action. Dimension \$/action Source PM(L) & Contractor

Description Shop space required for depot maintenance during year I. Dimension sq.ft./year Source PM(L) & Contractor Name MSSI(I) Shop space required for O/I maintenance Description during year I. Dimension sq.ft./year Source PM(L) & Contractor Name N(I)Description Number of equipments in the Navy's inventory system at the end of year I. Dimension equip/year Source PM(L) . Name NC(I) Description Number of copies of technical data to be distributed and inventoried during year I. Dimension copies/year Source PM(L) Name NK Description Total number of spare/repair items in the prime

Name NM

Dimension

Source

Name

Description Number of preventive maintenance types of the

prime equipment.
Dimensionless

equipment.

Dimensionless

PM(L) & Contractor

Dimension Dimensionless Source PM(L) & Contractor

MSSD(I)

Name Description Dimension Source	NN(I) Prime equipment annual acceptance schedule. Number of equipments acquired during year I. equip/year PMO & PM(L)
Name Description Dimension Source	NOH(I) Prime equipment overhaul schedule. Number of equipments scheduled to be overhauled during year I. equip/year PMO & PM(L)
Name Description Dimension Source	NP Number of pages per technical manual maintained by Navy. pages/copy PM(L) & Contractor
Name Description Dimension Source	NPM(N) Time between inspections of the Nth type of preventive maintenance action. hrs/action PM(L) & Contractor
Name Description Dimension Source	NPO(I) Prime equipment phase out schedule. Number of equipments scheduled to be phased out during year I. equip/year PMO & PM(L)

Name NSNP

Description Total number of new National Stock Numbers (NSN)

to be issued on the prime equipment

Dimension NSN

Source PM(L) & Contractor

Name NSNS

Description Total number of new National Stock Numbers (NSN)

to be issued on the peculiar Support & Test

equipments

Dimension NSN

Source PM(L) & Contractor

Name OHL

Description Prime equipment overhaul maintenance labor time.

Dimension hrs/equip

Source PM(L) & Contractor

Name OHM

Description Prime equipment overhaul maintenance material cost.

Dimension \$/equip

Source PM(L) & Contractor

Name OHT

Description Prime equipment overhaul maintenance material

shipping rate.

. Dimension \$/equip

Source PM(L) & Contractor

Name 07

Description Prime equipment annual operating time.

Dimension hrs/equip/year

Source PMO

Name PMG(I) Description Government project management costs incurred during the Investment period in year I. This refers to the technical and administrative planning, organizing, directing, coordinating, controlling and approval actions designed to accomplish overall program objectives. Examples of these activities are configuration management, cost/schedule management, data management, contract management, value engineering, quality assurance, and integrated logistic management. Dimension \$/year Source PMO PO Name Description Number of personnel required to operate a prime equipment. Dimension personnel/equip Source PM(L) PSOS Name Description Floor space required for the operation of a prime equipment. Dimension sq.ft./equip Source PM(L) & Contractor Name PSS(I) Description Production support and services cost incurred during the Investment period of the life cycle cost. These are the supportive costs incurred during the production of the prime equipment. costs may include engineering, facilities, production tooling and testing equipment, quality assurance, overhead costs of general and administrative expenses and contract fee. (NOTE: All or a portion of these costs may be included in the prime equip-

Dimension

Source

\$/year

PMO

be carefull not to double count the cost).

ment hardware acquisition cost. If so user should

PTE(I) Name Production Test and Evaluation costs incurred Description during Investment period in year I. refer to Production Acceptance Test (PATE) and Operation Acceptance Test (OTE). Production Acceptance Tests are conducted on production items produced early in the production run. They are designed to assure that production equipments conform to design specifications and performance requirements when manufactured in accordance with production specifications. Operational tests are conducted by user personnel under the conditions of the operational tactical environment. They are designed to determine the equipment operational effectiveness and validate organization doctrine, tactics, training requirements and logistic support. Dimension \$/year Source **PMO** Name PTI(I) Description Number of instructors to receive initial training during year I. Dimension student/year Source PM(L) Name PTM(I) Description Number of O/I maintenance personnel to receive initial training during year I. Dimension student/year Source PM(L) Name PTO(I) Number of Operating personnel to receive initial Description training during year I.

student/year

PM(L)

Dimension

Source

Name PTP(I)

Description Number of depot maintenance personnel to receive

initial training during year I.

Dimension student/year

Source PM(L)

Name QTY(K)

Description Number of quantities of Kth spare/repair item

Dimension quantity/item

Source PM(L)

Name R(K)

Description Mean Time Between Failures of the Kth spare/repair

item.

Dimension hrs/failure

Source PM(L)

Name RAM

Description Operator and O/I level maintenance personnel

attrition rate.

Dimension ratio Source PM(L)

Name RAP

Description Depot level maintenance personnel attrition rate.

Dimension ratio Source PM(L)

Name RDM

Description Technical data management costs for file mainte-

nance.

Dimension \$/page/year

Source PM(L)

Name RIE Average National Stock Number (NSN) entry cost Description into the supply system. Dimension \$/NSN Source PM(L) RIM Name Description Supply support management item retention and field administration cost. Dimension \$/NSN Source PM(L) Name RO Description Prime equipment operator pay rate. Dimension \$/hr/man Source PM(L) RPL Name Description Packaging labor cost. Dimension \$/# Source PM(L) Name RPM Description Packaging material cost. Dimension \$/# Scurce PM(L)

RSD Name Description Depot maintenance personnel pay rate to repair failed items. \$/hr/man Dimension Source PM(L) RSL Name Description O/I maintenance personnel pay rate to remove replace or repair failed items. Dimension \$/hr/man PM(L) Source RSR Name Description Average shipping Cost. Dimension \$/# Source PM(L) Name RSS(K) Description Fraction of failures repaired at the intermediate maintenance level. This value lies inclusively between "0" and "1". "0" refers to all depot repair and 1 refers to all intermediate depot repair. Dimension ratio Source PM(L) & Contractor Name RW(K) Description Ratio of the shipping weight to the unpacked weight of the Kth item. Dimension ratio Source PM(L) & Contractor

Name STE(I) Support & Test equipment acquisition costs Description incurred during Investment period in year I. This refers to the Support & Test equipments required to maintain and care for the prime equipment while not directly engaged in the performance of its mission. This includes vehicles, equipment and tools used to service transport and hoist, repair, overhaul, assemble, disassemble, test, inspect or otherwise maintain the mission equipment. This also includes the software costs associated with the Support & Test equipment. Dimension \$/year Source **PMO** STEM Name Description Support & Test equipment initial support rate. Percent of S&TE acquisition cost Dimension ratio Source PM(L) STES Name Description Support & Test equipment recurring support cost. Dimension \$/Prime Equipment Source PM(L) Name W(K) Unpacked weight of the Kth spare/repair item. Description

PM(L) & Contractor

Dimension

Source

Name

TERM

Description

Termination cost and/or value of the prime

equipment.

Dimension Source

\$/equip PM(L) .

Name

Y

Description

Total number of years covered by the life cycle cost analysis.

Dimension

dimensionless

Source

PMO

APPENDIX C

Inflation/Discounting Adjustment Factors

Inflation/Discounting Adjustment Factors

Life Cycle Cost Analysis is concerned with the evaluation of alternatives. These alternatives are described by indicating the timing of the future disbursements that will result from each procurement decision. Guidelines for adjusting future expenditures for the effects of time, cost of capital and inflation are found in SECNAVINST 7000.14B.

The LCC MODEL developed by the Naval Material Command adjusts all costs which occur during and after the BY (Base Year). The adjustment factors convert the future expenditures to current dollar value, which represents the general purchasing power of the dollar at the time of the decision, by the following method:

Future current dollar value is

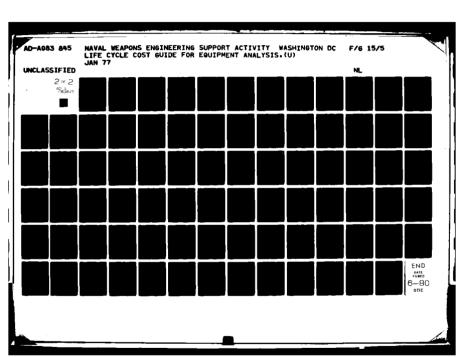
$$\left(1+iR\right)^n$$

Where

"IR" is the annual inflation rate

"n" is the number of years after the base point decision

The adjustment factor then converts this future current dollar expenditure into its present value dollar by the following method:



Present value dollar is

$$\left\{\frac{1}{1 + DR}\right\}^{n}$$

Where

"DR" is the annual discount rate

The present value dollar represents the amount of money the Government must put into an interest or profit generating account at the time of the decision to have the future current dollar available for an expenditure at the end of " n " years.

The above equations assume that the future expenditure occurs at the end of " n " years but the cost is usually incurred throughout the year. Therefore, in accordance with SECNAVINST 7000.14B, an aritmetic mean (average) adjustment factor equation has been developed for the LCC MODEL:

Annual adjustment factor is

$$\left\{ \left\{ \frac{1 + IR}{1 + DR} \right\}^{n-1} + \left\{ \frac{1 + IR}{1 + DR} \right\}^{n} \right\} \stackrel{\bullet}{\longrightarrow} 2$$

NAVMAT LCC Model uses four inflation adjustment factors and one discount adjustment factor subscripted by year.

APPENDIX D

NAVMAT Equipment LCC Model Sample Computer Run

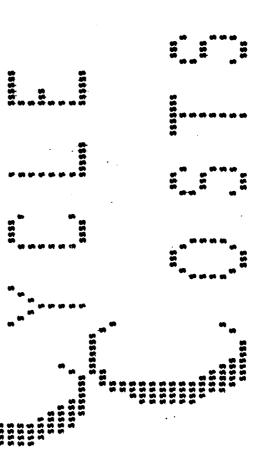
NAVMAT EQUIPMENT LCC Model Sample Computer Run

This Appendix contains an example of the types of Reports available from the LCC Computer program developed by the Naval Material Command.

The values used in this sample data should not be considered as reference for actual calculations.

All input and output reports are provided in constant dollars except the Summary Output Report which is provided in constant dollars, inflated dollars, and inflated and discounted dollars.

A sensitivity analysis is provided for both the Scalar and the Array type of variables.



(LCC FLEX)

SAMPLE COMPUTER RUN FOR NAVNAT EQUIPMENT LIPE CYCLE COST MODEL

ANALYSIS IDENTIFICATIONS

DATE 11/ 1/76

C

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MAYAL WEAPONS ENGINEERING SUPPORT ACTIVITY ESA-8431

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HM WASHINGTON, D.C. 20374

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SAMPLE COMPUTER RIIN FOR NAVNAT EQUIPMENT LIFE CYCLE COST MODEL

DATE 11/ 1/76

RFMARKS

THIS PROGRAM IS RASED ON COST ALGORITHIMS PROVIDED BY THE NAVAL WEADONS ENGINEERING SUPPORT ACTIVITY MANAGEMENT ENGINEERING DEPARTMENT COST MANAGEMENT DIVISION.

DATA IS PROVIDED FOR SAMPLE PURPOSE ONLY AND SHOULD NOT'BE USED AS A BASE FOR INTERPRETATION FOR ANY PROJECT.

GUESTIONS FOR INTERPRETATION OF INDUT. DATA OR LCC PHILOSOPHY SHOULD BE DIRECTED TO ALGUM ATAY

MACHINGTON NAVY YARD

WASHINGTON, D.C. 20374

PHONE 202-433-4084

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REPAIR WATERIAL RATE (RATIO)

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DESTRED MANNING LEVEL FOR O/I LEVEL MAINTENANCE PERSONNEL ( PERSONNEL/YEAR)
DESTRED MANNING LEVEL FOR DEPOT LEVEL MAINTENANCE PERSONNEL ( PERSONNEL/YEAR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ( RATIO )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           THE KTH SPARE/REPAIR ITEM
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PAGE 3.002

SAMPLE COMPUTER RUN FOR NAVMAT FOUIDMENT LIFE CYCLE COST MODEL

04TE 11/ 1/76

		MAMES. DESCRIPTIONS. DIMENSIONS. AND VALUES OF RUILT-IN VARIABLES	
NAME	•	DESCRIPTION	
9	300.000.00	ACQUISITION COST OF DATA DURING INVESTMENT PERIOD (S/YEAR) 0.00 0.00 0.00 0.00	
A0C	500.000.005	GOVERWHENT PAYNENTS TO THE CONTRACTOR FOR TECHNICAL AND MNAGERIAL WORK PERFORMED DURING VALIDATION PHASE 6.66 0.60 0.00	(8/YEAR)
5	756.000.00	GOVFRNMENT EXPENDITURES FOR TECHNICAL AND MANAGERIAL WORK PERFORMED DURING VALIDATION PHASE (\$/YEAR) 0.00 0.00 0.00	
A10	50,606,60	ACQUISITION, TRANSPORTATION. AND INSTALLATION COSTS OF TRAINING AIDS AND DEVICES DURING INITIAL TRAINING 6.66 0.66 0.60	(S/YEAR)
>	1.00	BASE YEAR DURING/FROM WHICH ALL COST ADJUSTMENTS ARE MADE (DIMENSIONLESS)	
5	2.00	ENFRGY CONSUMPTION COST INCURRED DURING THE OPERATION OF THE PRINE EQUIPMENT (S/MR/EQUIP.)	•
CIPE	1.500.08	INSTALLATION COST OF THE PRIME EQUIPMENT (S/FOUIP.)	
5	05.0	COST OF MATERIALS CONSUMED DURING THE OPERATION OF THE PRINE EQUIPMENT (\$/HR/FQUIP,)	
8	0.05	AVERAGE COST PER PAGE OF SET-UP, REPRODUCTION AND DISTRIBUTION OF TECHNICAL MANUALS (S/PAGE/COPY)	
S	6.00 0.00	SOFTWARE MAINTENANCE COST DURING PRIME EQUIPMENT OPERATION (\$/YEAR)	
CSD	2.40	AREA COST FOR DEPOT LEVEL MAINTEMANCE (8/50, FT./VEAR)	
23	240.00	AREA COST FOR 0/1 LEVEL MAINTENANCE SPACE (\$/59. FT./YEAR)	
CSO	240.00	AREA COST FOR OPERATIONAL SPACE (\$/59. FT./YEAR)	
CST	115) 750.00	UNIT COST OF THE KTH SPARE/REPAIR ITEM (\$/ITEM) 1.200.00 5.000.00 4.200.00 1.700.00 3.500.00 3.500.00 9.000.00 500.00	500.00
E	3.000.00	AVFRAGE INSTRUCTOR TRAINING COST FOR PERSONNEL PAY L ALLOWANCE TRAVEL AND COURSE FEES (S/STUDENT)	

D-13

0ATE 11/ 1/76	SAMPLF	COMPUTER RIM FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL
		NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES
NAMF		DESCRIPTION
CTH 75	AVERAGE O/I MAINTENANCE PERSON	PERSONNEL TRAINING COST FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES \$/51UDENT
CT0 5.0	AVERAGE OPERATING PERSONNFL TR	TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES (S/STUDENT)
1.00	AVERAME DEPOT "MAINTENANCE PEPS.	PEPSONNEL TRAINING COSTS FOR PAY & ALLOWANCE, TRAVEL AND COURSE FEES (S/STUDENT)
CTPE	TRANSPORTATION COST OF PRIME E	EQUIPMENT FROM CONTRACTORS FACILITY TO INSTALLATION SITE (\$/EQUIP.)
CU 50.00	SO.000.00	CONTRACTORS EQUIPMENT (S/EQUIPMENT)
2	(15') DUTY CYCLE OF THE KTH SPARE/REPAIR ITEM 0.75 0.75 0.75 0.75 1.00 1.00 1.00	PAIR ITEM (RATIO) 0.75 0.75 0.75 0.75 1.00 1.00 1.00
150.00	(5) PAYMENT BY THE GOVERNMENT TO TI 150.000.00 0.00 0.00	THE CONTRACTOR FOR ALL THE DATA ACQUIRED DURING FULL SCALE DEVELOPMENT (\$/YEAR) 0.00
0CE ((5) PAYMENT BY THE GOVERNMENT TO TI 600,000,00 0.00 0.00	THE CONTRACTOR FOR THE ENGINEERING EFFORTS DURING FULL SCALE DEVELOPMENT (S/YEAR)
0CH 600.00	1 S) PAYMENT BY THE GOVERNMENT TO TI 646.000.00	THE CONTRACTOR HARDWARE DEVELOPHENT EFFORTS DURING FULL SCALE DEVELOPHENT 1 S/YEAR 1 0.00
DCPt	(5) PAYWFNT BY THE GOVERNMENT TO TI 200.000.00	THE CONTRACTOR MANAGEMENT EFFORTS DURING FULL SCALE DEVELOPMENT (\$/YEAR) 0.00 0.00
DCS ((5) PAYMENT BY THE GOVERNMENT TO TI 150.808.00 0.00 0.00	THE CONTRACTOR SOFTWARE DEVELOPMENT EFFORT DURING FULL SCALE DEVELOPMENT (S/YEAR) 0.00 0.00
0CST (5) PAYMENT BY THE GOVERNMENT TO 0.00 0.00	THE CONTRACTOR SLIE DEVELOPMENT EFFORT DURING FULL SCALE DEVELOPMENT (S/YEAR) 0.00 0.00
0CTF ((5) PAVMFNT BY THE GOVERNMENT TO TI 75,800.00 0.00 0.00	THE CONTRACTOR TESTLEVALUATION EFFORTS DURING FULL SCALE DEVELOPMENT (S/YEAR) 0,00
)	5) GOVERNMENT PROJECT MANAGEMENT	COSTS INCURRED DURING FULL SCALE DEVELOPMENT (S/YEAR)
06TA ((5) GOVERNMENT COSTS FOR TEST SITE 50.000.00	ACTIVATION/DEACTIVATION DURING FULL SCALF DEVELOPHENT TEE PROGRAM (\$/YEAR) 0.00
•	•	READ ARRAY VALUES FROM LEFT TO RIGHT

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SAMPLE COMPUTER HIM FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL

NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES

DESCRIPTION

0ATE 279	.(5).	60VERNMENT PERSONNEL COSTS INCURRED DURING FUL	L SCALE DEVELOPMENT TAF PROGRAM (0.00	FOR TESTING & EYALUATION (S/VEAR)	_
100	10.000.00	GOVERNMENT COST TO TRAIN STUDENTS DURING FULL 0.00	SCALE DEVFLOPMENT TEST & EVALUATION PROGRAM 0.00	ON PROGRAM (S/YEAR)	
ž	6 5)	ANNUAL DISCOUNT RATE FOR FUTURE COSTS (RATIO 0.10	0,10		
)\$Q	15)	DISCAND RATE OF THE KTH ITEM (RATIO) 0.26 0.10 0.10 0.10 0.10	0.00 0.10 0.00	01.0	9
FORT	117.00	REQUIRED STOCKAGE TIME FOR DEPOT LEVEL REPAIRABLE ITEMS AT 0/1 AND DEPOT LEVEL	E ITEMS AT 0/1 AND DEPOT LEVEL	(DAYS)	
FILS	00.00	REQUIRED STOCKAGE TIME FOR REPLENISHMENT SPARES AT 0/1 LEVEL	AT N/1 LEVEL (DAYS)		
181	3.00	REPAIR CYCLE TIME OF REPAIRABLE ITEMS AT O'I LEVEL	/EL (DAYS)		
£	0.12	REPAIR MATERIAL RATE (RATIO)			
FES	6 5)	MAINTENANCE SITE CONSTRUCTION/PREPARATION COST	S DURING INVESTMENT PERIOD (\$/YEAR 0.00	'EAR)	
FOS	0.00	OPERATIONAL SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD 150.000.00 75.000.00 0.00	DURING INVESTMENT PERIOD (S/VEAR).00	EAR)	
FPST	411.00	PROCUREMENT LEAD	AND SAFETY LEVEL STOCKAGE TIME FOR INITIAL SPARE AND RFPAIR PARTS	ATS (DAYS)	
Ē	1.00	RELIABILITY IMPROVEMENT OR DEGRIDATION FACTOR 1.00 0.90	(DIMENSTONLESS)		
1PCON	6 5)	ANNUAL INFLATION RATE FOR FUTURE COSTS 0.06 0.06 0.06	FOR CONSTRUCTION TYPE OF FUNDING (RATIO 0.06	(0	
1001	6.05	ANNUAL INFLATION RATE FOR FUTURE COSTS OF 0.05	OLM TYPE OF FUNDING (RATTO)		
JAPANC	(5) 0.07	ANNUAL INFLATION RATE FOR FUTURE COSTS 0.07 0.07	OF PROCUPEMENT TYPE OF FUNDING (RATIO) 0.07	-	
1880	6 50.05	ANNUAL INFLATION RATE FOR FUTURE COSTS OF RED TYPE OF FINDING 0.05 0.05 0.05	PE OF FINDING (RATIO)	•	
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SAMPLE COMPUTER RUM FOR NAVMAT FOUIDMENT ES. DESCRIPTIONS, DIMENSIONS, AND VALUES OF DESCRIPTION SO.00 RED FOR THE DEPOT INVENTORY (SO. FT./YEAR BO.00 NITIAL COST OCCUR (DIMENSIONLESS) REL FOR OPERATING PERSONNEL (PERSONNEL/YE RO.00 EL FOR O/I LEVEL MAINTENANCE PERSONNEL/YE BO.00 RO.00 RO.0	LE COST MODEL PAGE +.80+	•				•	L/YEAR)	(PERSONNEL/YEAR)	CTION)		00°F	(HR/ITEM) 4.00 2.00 2.00	1 NOI		•		
		DESCRIPTION		STABAGE SPACE REQUIRED FOR THE O/I INVENTORY (SQ. FT./YEAR)		2		MAINTENANCE PERSONNEL 10.00	NCE LAGOR TIME FOR NTH MAINTENANCE ACTION	LABOR TIME TO REPAIR THE KTH ITEM 16.00 0.00 15.00 15.00		LEVEL MAINTENANCE LABOR TIME TO REMOVE AND REPLACE THE 2.00 4.00 1.00 3.00	MATERIAL COST FOR NTH TYPE OF PREVENTIVE MAINTENANCE ACTION (\$/AC)	FOR DEPOT LEVEL MAINTENANCE (SO, FT./YEAR 50.00 150.00		S IN THE NAVY'S INVENTORY SYSTEM	ATTENDED OF ACTUAL AND
	1/1/16		č. 0	6.00	2.00	0.00	0.00	6.00	6.2)		0.00		50.00	00.0	00.0	0000	

		THE STATE OF STATE OF STATE OF STATES OF STATE	
}		DESCRIPTION	
ŧ	25	TOTAL NUMBER OF SPARE/REPAIR ITEMS IN THE PRIME EQUIPMENT (DINEWSTONLESS)	
į	~	TOTAL NUMBER OF PREVENTIVE MAINTENANCE TYPES OF THE PRIME EQUIPMENT DIMENSIOMLESS ;	
š	6.60	PRIME EQUIPMENT ANNUAL ACCEPTANCE SCHEDULE (EQUIP./YEAR) Sa.00 30.00 20.00 20.00 0.00	
#0#	0.00	GUIP./YE	
9	200.00	NUMBER OF PAGES PER TECHNICAL MANUAL MAINTAINED BY NAVY (PAGES/COPY)	
ž	100.00	TIME BETWEEN INSPECTIONS OF THE PREVENTIVE MAINTENANCE ACTIONS (MR/ACTION)	
0	6.00	PRIME EQUIPMENT PHASE OUT SCMEDULE (EQUIP, /YEAR)	
NSN	75.00	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PRINE EQUIPMENT (NSN)	
NSNS	357,00	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PECULIAR SLTE EQUIPMENTS (NSN)	
¥6	120.00	PRIME EQUIPMENT OVERHAUL MAINTENANCE LABOR TIME (MR/EQUIP.)	
T T	1.500.00	PRIME EQUIPMENT OVERNAUL MAINTENANCE MATERIAL COST (\$/EOUIP.)	
DH1	500.00	PRIME EQUIPMENT OVERNAUL MAINTENANCE MATERIAL SMIPPING RATE (S/EQUIP.)	
-	1.600.00	PRIME EQUIPMENT ANNUAL OPFRATING TIME (HR/VEAR)	
9	0.0	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING INVESTMENT PERIOD S/YEAR)	
0	1.00	TE A PRIM	
Psos	50.00	FLOOR SPACE REGUIRED FOR THE OPERATION OF A PRIME EQUIPMENT (SQ. FT./EQUIP.)	

7.K

, Sample computer run for navmat equipment life cycle cost model	.NAMES. DESCRIPTIONS. DIMENSIONS. AND VALUES OF BUILT-IN VARIABLES DESCRIPTION	PRODUCTION SUPPORT & SERVICES COST INCURRED DURING THE INVESTMENT PERIOD 350.080.08	PRODUCTION TEST & EVALUATION COSTS INCURRED DURING THE INVESTMENT PERIOD 50.00	NUMBER OF INSTRUCTORS TO RECEIVE INITIAL TRAINING (STUDENT/YEAR) 15.60 0.60 0.60	NUMAFA OF G/I MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (ST 50.00 30.00 20.00	NIIMMER OF OPERATING PERSONNEL TO RFCEIVE INITIAL TRAINING (STUDENT/YEAR 56.00	NUMMER OF DEPOT MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR 16.00	NUMBER OF QUANTITIES OF A SPARE/REPAIR ITEM (QUANTITY/ITEM) 1.00 3.00 6.00 1.00 2.00 1.00 1.00	MEAN TIME BETWEEN FAILURES OF THE SPARE/REPAIR ITEM (HR/ITEM) 500.00 870.00 600.00 250.00 400.00 350.00 700.00 1.200.00 1.500.00	OPERATOR AND O/I LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO	DEPOT LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)	TECHNICAL DATA MANAGEMENT COST FOR FILE MAINTENANCE (1/PAGE/YEAR)	AVERAGE NATIONAL STOCK NUMBER INSN) ENTRY COST INTO THE SUPPLY SYSTEM	SUPPLY SUPPORT MANABEMENT ITEM RETENTION AND FIELD ADMINISTRATION COST	PRIME EQUIPMENT OPERATOR HOURLY PAY RATE (S/MR/OPERATOR)	PACKAGING LABUR COST (\$/LB.)	PACKAGING MATERIAL COST (S/LB.)
CLE COST MODEL	-IN VARIABLES	RIOD (S/YEAR)	RIOD (S/YEAR)		(STUDENT/YEAR)	MEAR 1	STUDENT/YEAR &	S.00		_			C NSN/S) I	ST (S/NSN)			
٠	•	-						1.00	00.00					·			
P A 6 E								2.00	350.00								
F 4.806								0 0	350.60		•						

. . . . READ ARRAY VALUES FROM LFFT TO RIGHT

DATE 1	0ATE 11/ 1/74	SAMPLE COMPUTER RUN FOR NAVMAT FOUTPHENT LIFE CYCLE COST MOMEL	PA6E	4.007
•		NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF RUILT-IN VARIABLES		
MANE		DESCRIPTION		
450	17.22	DEPOT MAINTENANCE PERSONNEL PAY RATE TO REPAIR FAILED ITEMS (S/HR/MAN)		
PSL	7.87	O/I MAÍNTFNANCE PERSONNEL PAY RATE TO REMOVE, REPLACE OR REPAIR FAILFO ITEMS (S/MR/MAN)		
a.	0.10	AVERAGE SHIPPING COST (\$/LA,)		
SS .	15)	FRACTION OF FAILURES REPAIRED AT THE INTERHEDIATE MAINTENANCE LEVEL FOR THE KTM ITEM (RATIO) 0.80 0.80 0.80 0.85 0.50 0.70 0.40	0.0 5.0	0.65
à	151	RATIO OF THE SHIPPING WEIGHT TO THE UNPACKED WEIGHT OF THE KTH ITEM (PATIO) 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	1.25	1.25
STE 50	(5) 500.000.002	SUPPORT & TEST EQUIPMENT ACQUISITION COST (\$/YEAR) 0.00 0.00 0.00 0.00		
STEH	0.75	SUPPORT & TEST EQUIPMENT INITIAL SUPPORT RATE, PERCENT OF SLTE ACQUISITION COST (RATIO)		
STES	5.000.00	SUPPORT & TEST EQUIPMENT RECURRING SUPPORT COST PER PRIMEEQUIPMENT (\$/FQUIP.)		
1624	1.200.00	TERMINATION COST AND/OR VALUE OF THE PRIME EQUIPMENT (\$/EQUIP.)		
3	(15) 75.00 275.00	UNPACKED WEIGHT OF THE KTH ITEM (LR./ITEM) 100.00 170.00 300.00 50.00 600 310.00 140.00 260.00 700.00	00.000	450.00
	r	OF YEARS COVE	•	•
•	•			

PA6E 5.00

SAMPLE COMPUTER RUN FOR NAVHAT EQUIPHENT LIFE CYCLE COST MODEL

USER DEFINED SCALARS

NO SCALARS

D-20

SAMPLE COMPUTER RIM FOR NAVNAT FOUTPMENT LIFE CYCLE COST MODEL

DATE 11/ 1/76

PAGE 5.002

USER DEFINED ARRAYS

NO ARRAYS

P40£ 6.001		DISCOUNT FACTORS		0.955	9,00	0.789	0.717	0.652
		•	# J 0	0.977	0.033	064.0	0.00	0.033
OST MODEL		INFLATION AND DISCOUNT FACTORS	CONSTRUCTION	0.982	9.040	0.912	0.879	0.847
SAMPLF COMPUTER RUN FOR NAVMAT FQUIPMENT LIFE CYCLE COST MODEL	ORS	INFLATION AND	PROCUREMENT	0.986	0.050	0.93	400.0	0.883
IAVMAT FOUTPHE	COST ADJUSTMENT FACTORS		6	0.980	0.039	106.0	198.0	0-850
RUN FOR N	COST AD		7 0	1.025	1.076	1.130	1.187	1.246
SAMPLF COMPUTE		ATION FACTORS	CONSTRUCTION	1.030	1.092	1.157	1.227	1.300
		INFLATIO	PROCUREMENT	1.035	1.107	1.105	1.264	1,357
176			0	1.027	1.084	1.14	1.207	1,273
DATE 11/ 1/76		V£49		-	~	~	•	v î

******** MILITARY PERSONNEL FUNDING USES THE SAME COST ADJUSTHENT FACTORS AS OLM ********

		Automia		
SSS COSTS IN DOLLARS SSS	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SUPPRINT	**************************************	CONSTANT BOLLARS
	DEVELOPMENT	INVESTMENT	\$10	TOTAL
CONTRACTOR 4 OF COST CATEGORY TOTAL 4 OF COST ELEMENT TOTAL	2,825,000 106,0			2,525,000 100.0
	800.000 46.5 20.2	920,000	•••	1.720.000
	325,000 86.7 8.2	000000 13.9		375.000
PRINE EQUIPMENT & OF COST CATEGORY TOTAL & OF COST ELEMENT TOTAL		5.550.000		8,560,000 100.0
TRAINING N OF COST CATEGORY TOTAL N OF COST ELEWENT TOTAL	10,000	200,000	143,900	0.00 H
		3,262,675	4,582,801	7,845,476
TECHNICAL DATA COST CATEGORY TOTAL OF COST ELFMENT TOTAL		300,250	0.15	100.00
	000	0.001		000000000000000000000000000000000000000
OPFRATION % OF COST CATFRODY TOTAL % OF COST ELEMENT TOTAL	c o o	225,000	8,050,760 97,3	8,275,760
MAINTENANCE B. OF COST CATEGORY TOTAL B. OF COST ELEMENT TOTAL	0 0 0	600.000	16.025.647	10,625,647
COST FLEMENT TOTAL 1 % OF LIFE CYCLE CAST 1	3,960,000	11.617.925 1	30.683,107	46,461,033

PAGE 8.001	A\$***** COST	CATEGORY TOTAL	2.625.000	1.720.000 1.00.0	375.000	5.560.000	353,900	7.845.475	380,250	500.000	8.275.760 100.0	18.625.647	16.461.033
	+CONSTANT DOLLARS++++	OTHERS	00	000	999	• • •		00			90	90	•
E COST MODEL	**************************************	HIL. PERSONNEL	00	00	00	000	290,000	•••			3,525,760 42.6 56.3	2.443.083	6.258,843
MENT LIFE CYCLI	•	3	000		000	900	13,900	4,626,001 59.n 23.7	80,000		1,165,000	13,658,724 73,3 69,9	19.543.624
OR NAVMAT EQUIF	FUNDING VS. COST CATEGORY	CONSTRUCTION	00		50.000	e o					3.585.000 43.3	2,523,940	6.158.840
SAMPLE COMPUTER RIM FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL	FUND	PROCUREMENT	900	920.000	50.000 13.3	5.560,000	50,000 14.1	3.219.475	300,250	500.000	00	000	10.599.725
SAMPLE	1 1	G	2.825.	-	275,000 73,3 7.1	0.00	0.5			000	00	000	3,900,000
DATE 11/ 1/76	SSS COSTS IN DOLLARS SSS	,		MANAGEMENT COST CATEGORY TOTAL FUNDING TYPE TOTAL	FESTING COST CATEGORY TOTAL OF FUNDING TYPE TOTAL	S OF FOURTHEAT S OF FOURTH	TRAINING 8 OF COST CATEGORY TOTAL 8 OF FUNDING TYPE TOTAL	; -		SUPPORT FOUTPHENT 8 OF COST CATEGORY TOTAL 8 OF FUNDING TYPE TOTAL	OPERATION & OF COST CATEGORY TOTAL	MAINTFNANCF © OF COST CATEGORY TOTAL! © OF FUNDING TYPE TOTAL!	FUNDING TYPE TOTAL

T	888 C057S	SSS COSTS IN DOLLARS SSS	COST BREAKDOWN BY YEAR	387200000	SE YEAR-1	.CONSTANT BOLLARS****	LARSoons
TOTAL LIFE CYCLE TOTAL LIFE	COST BREAKDOWN			0	• •	4	7
POTAL LIFE CTCLE	STRUCTURE	z	-	~		•	•
VALIDATION	00000	TOTAL LIFE CYCLE	4.975.000	6,393,712	10.996.970	12.147.304	11.968.047
CONTRACTOR CONTRACTOR	100000	PESEARCH AND DEVELOPMENT	3.960.000	•	•	•	
CONTRACTOR CONTRA	110000	VALIDATION	750.000	d	•	•	
FULL YCALE DEVELORENT 2,325,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	111000	CONTRACTOR	200.000	• 6	•	•	
TOTAL EVALUATION	112000	GOVFRUMENT	250,000	•	•	•	•
CONTINUE	120000	FULL ACALE DEVELOPMENT	3,210,000	~ '	•	•	
FUGINEERING CONTOURNEY FORTHER NAME CONTOURNEY FORTHER NAME CONTOURNEY CONTOU	121000		200,000	•	5 (
Triangle	002121		200-004	•	•	•	
Try	121300	PECTOTOR HARDWARF	000-009	• •	• •	9	
Trata & EVALUATION	121400	SOFTERS	150,000	•	•	•	
SUPPORT L TEST EQUIPMENT 150,000 0 0 0 0 0 0 0 0	121500	TFST & EVALUATION	75,000	• •	•	•	
GOVERNMENT TEST EQUIPMENT S50,000 G G G G G G G G G	121400	DOCUMENTATION	150.000	·c	•	•	
STATISTICATE STAT	121700	SUPPORT & TEST EQUIPMENT	350.000	•	•	•	
PROGRAM MANAGEMENT S55,000 0 0 0 0 0 0 0 0 0	122000	GOVERNMENT	885,000	•	•	•	
TEST & EVALUATION 335,000 0 0 0 0 0 0 0 0 0	122100	MAN	550+000	đ	•	•	
TEST & CALUATION	122200		335,000	•	•	•	٠
TEST & CITE ACTIVATION	122210		10.000	6	•	•	
INVESTMENT PROBRAM MANAGEMENT PROBLEM	122220	SITE	50,000	•	e	• •	
INVESTMENT PROGRAM MANAGEMENT PROPERTY PROPERTY PROGRAM MANAGEMENT PROPERTY PROPETTY PROPERTY PROPE		•				ļ.	
### ### ##############################	200000		975,000	5,849,552	3.053.661	1.739.712	
PRINT FULLPHENT ACQUISITION PRODUCTION TARBWARE PRODUCTION HARDWARE PRODUCTION HARDWARE PRODUCTION HEST & EVALUATION PRODUCTION TEST & EVALUATION FACULATION PRODUCTION TEST & EVALUATION FACULATION PRODUCTION HEST & EVALUATION FACULATION PRODUCTION AND DISTRIBUTION FACULATION PRODUCTION AND DISTRIBUTION FACULATION FACUL	210000	2	•	650.000	270.000		
PRODUCTION HARDWARE PRODUCTION HARDWARE PRODUCTION SUPPORT & SERVICES PRODUCTION SUPPORT & SERVICES PRODUCTION SUPPORT & SERVICES PRODUCTION SUPPORT & SERVICES PRODUCTION TEST & EVALUATION FACILITIES PRODUCTION TEST & EVALUATION FACILITIES PRODUCTION TEST & EVALUATION FACILITIES PRODUCTION AND DISTRIBUTION PR	220000	- 1	•	3.005.000	1,563,000	10048.000	
PRODUCTION SUPPORT & SERVICES PRODUCTION SUPPORT & SERVICES PRODUCTION SUPPORT & SERVICES TRANSPORTATION INSTALLATION & CMECKOUT INSTALLATION SOUPPORT & TEST EQUIPMENT & SOUPPORT SUPPORT & TEST EQUIPMENT SOUPPORT & TEST EQUI	221000			2.500.000		000.000.	
TRANSCORTATION	222000	¥ .	•	350.000	•		
INSTALLATION & CHECKOUT INSTALLATION & CHECKOUT INSTALLATION & CHECKOUT INSTALLATION & CHECKOUT SUPPORT & TEST EQUIPHENT ACQUISITION SUPPORT & TEST EQUIPHENT ACQUISITION SUPPORT & TEST EQUIPHENT SUPPORT & TEST EQUIPHENT	20.00	E EVALUATION	9 (000.00	j		
INTITIAL SIPPORT & CQUISITION 975,000 2,194,552 1,220,661 1,611,612	000000	THE STORY	•			500·21	
SUPPLY SUPPORT LEST EQUIPMENT ACQUISITION 500,000 1,555,802 908,161 14771AL SPARFS FAITIAL SPARFS PHINE EQUIPMENT LEST EQUIPMENT 1 125,000 1,513,602 908,161 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	000000	-	9 4	•	•		
SUPPLY SUPPORT INTIAL SPARFS INTIA	2000	٠,		:	1 44 4 4 2 2 4 1		
	232000			1.556.802	908.161	472.712	
PHIME EQUIPMENT 125,000 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 0 1,513,602 908,161 1 1,	232100		000.40	1.613.602	908-161	672.712	
SUPPORT & TEST EQUIPMENT 125,000 0 43,200 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	232110	LN3METED IN INC		1.513.602	908.161	672.712	•
NCN ENTRY INTO THE SUPPLY SYSTEM 0 43,200 275,000 275,000 250,000 275,000 25,00	232120		125,000				
FACILITIES FACILITIES HAINTENANCE FACILITIES HAINTENANCE FORMULENTATION ACQUISITION FORMULENTATION FORMULENTATION ACQUISITION FORMULENTATION FORMUL	232200	TO THE SUPPLY	•	43.200	•	•	
	233000		•	550,000	275,000	•	
## INTENANCE 0 400,004 200,600 POCINENTATION POCINENTATION			•	150.000	15.000	•	•
### ### ### ### ######################	233200	HAINTENANCE	•	400.004	200.000	•	
ACQUISITION AND DISTRIBUTION OF SO.000 07,500 37,500 07,50	234000	DOCUMENTATION	300.000	250	•	•	
REPRODUCTION AND DISTRIBUTION 6 256 6 TRAINING TRAINING 50,000 07,500 37,500	234100		300.000	•	•	•	
TRAINING SO. 000 001,500 37,500 000 001,500 000 000 000 000 000 000 000 000 000	234200	UCT 10N	•	250	•		
CPERATOR 5.556	235000		20.000	67,500	37,500	25.000	
	235100		•	25.000	2.000	800.0	

•	PAGE 9.002	•		s	••	•	11.998.047	259,200	1200.000	900.08	15.000	5,617,927	072.116	329,10 6 522,760	220.248	2,687,886	139.831	569.916	148.178	132,216	120,000	165,312	120,000	900.000	480.960	240,360	360	240.600	000.042	20.000	.848,132	1,004,932	43.500 41.12	80.00	30.00	1.300
3 3 5 6 4		CONSTANT DOLLARS	Y E A R	*	••	•	10.407.592 11				15.000		693.430	274,257					123,482	132,216	120.000	9 9	•	200.008	446.960	240,360			240.000	•	•	.504.110		90.00	30.00	906.1
9 n c + 3 y	COST MODEL	YEAR=1	E 0		•	•	7,943,308	1,007,360	960.000	000149	15,000	3,370,756	643,270	197,465	132,149	1,612,732	663.669	341,949	68,907	105,773	96,000	•	•	400.004	440.950	240,360	996	240,600	240.000	20,000	1,126,159	082,95	00000	16.000	24.000	900.1
0 2 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	CYCLE	# # # # # # # # # # # # # # # # # # #	\$ 0 J	. ~	16.000	0	544,160	3 6	6				•	c c	.	.	• •	. a	•	.	•	.	e	9 9	480.960	240,360	50F	240,608	240.000	20.00	43.200	9		: c	•	é e
3	RUN FOR NAVMAT EQUIPMENT LIFE	COST BREAKDOWN BY YEAR		-	•	000.0%	•		•		•	o <i>e</i>	•	•		•	3 9	• •	0 (, ,	•		•	5 G	•	•	9 3	•	•	. •	•	•	• •	•		••
DZI FFYFL MACMIENANCE	SAMPLE COMPUTER	CC COSTS IN DOLLARS SSS		COST BREAKDOWN STRUCTURE ELEMENT	DEPOT LEVEL MAINTENANCE INSTRUCTOR	TRAINING AIDS	OPERATING AND SUPPORT	PERSONNEL	S	MATERIAL CONSUMPTION	SOFTWARE MAINTENANCE	SUPPORT COSSECTIVE MAINTENANCE		O/I LEVEL (REMOVE & REPLACE) O/I LEVEL (REPLACE)	DEPOT LEVEL (NEPAIR)	PEPAIR MATERIAL	EATERIAL TANDING LABOR	PACKAGING MATERIAL	. SALPPING.		HATERIAL	LABOR.	MATERIAL	ALIBERT A TEST EQUIDAENT EXIMENANCE	FACILITIES	STATE STATE	OF LEVEL	INVENTORY STORAGE	O/T LEVEL	DOCUMENTATION MAINTENANCE	•	N 1		OPERATOR	DAT LEVEL MAINTENANCE	DFPOT LEVEL MAINTENANCE TEHMINATION
6 5 7 7	04TE 11/ 1/76	SES COSTS	COST BREAKDOWN	STRUCTURE	235300	235500	30000	311000	312000	314000	315000	321000	321100	321110	321130	321200	321.300	321320	321330	322100	322200	323100	323200	32400	325060	325100	325120	325,200	325210	32400	327000	327100	328000	32A100	324700	33000

	****** YEAR" CONSTANT BOLLARS*
SAMPLE COMPUTER RUN FOR NAVNAT FRUIPMENT LIFE CYCLE COST MODEL	COST BREAKDOWN TOTALS ************************************
DATE 11/ 1/76 SAMPLE COMPUTER A	SSS COSTS IN DOLLANS SSS

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PAGE 10.001

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	TOTAL ADJUSTED COST	<pre>< <</pre>	L ABJUSTED LIFE CYCLE	<	
0 0 0 0	TOTAL LIFF CYCLE	46.461.033		•	100.0	
9000	RESEARCH AND DEVELOPMENT	31960.000				
110000	VALIDATION	750.000		1:6		
111000	CONTRACTOR	500.000				
_	GOVERNMENT	250,000	•			
120000	FULL SCALE DEVELOPMENT	3.210.000	•	6.		
121000	CONTRACTOR	2,325,000	ri .	9.0		
121100	MANAGERENT	200.002	***			
121200	FNGINFERING	B00.00E	2.0			
121300	PROTOTYPE MARDWARE	000.004	m.			
121400		B00.000				
121500	TEST & FVALUATION	000-51	2.0			
904171	MONORIUS ASSISSIONIS					
19906				9.		
122100			2.7			
122200	PROTOTYPE TEST & EVALUATION	335.000				
122210		000.01	0.0			
122220	TEST SITE ACTIVATION	000000				
122230	TEST & EVALUATION	275,000	9.0			
20000		11.617.925			25.0	
21000	TARTERNAM MARGORD INTERNATION	920.000		2.0		
220000		3.610.000		12.1		
221000		000+000+30	01	10.0	•	
222008	PHODUCTION SUPPORT & SERVICES	350+000	•	9.0	•	
223000	PRODUCTION TEST & EVALUATION	50.000	•	1.0		
224000	TRANSPORTATION	000.05	•	a.1	,	
225600	3	350.000	•	0.0	٠.	
23000	3	5,067,925	•			
231600	SUPPORT & TEST EQUIPMENT ACQUISITION	000.000	→ 1		•	
732000	thought your	6/9120216		•		
232180		# 1 0 0 1 0 0 1 C				
227.11	ALIBOART & TEST FOLITORINA	0 - P - P - P - P - P - P - P - P - P -			•	
21226						
211000		00000000		1.1		
		224,000		1		
233200	MAINTENANCE	000.009	E*I		,	
234000	DOCUMENTATION	300,250		••		
234100		300.000	•••			
234200	REPRODUCTION AND DISTRIBUTION	250	•••			
73566		990.09%		•		
235100	OF RAIDA	00400				
235200	O/T LFVEL MAINTFNANCE	15.000	2.0			

047E 11/ 1/76		SAMPLE COMPUTER RUN FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL	LIFE CYCLE COST MODEL	PAGE 10.002
\$5\$ COSTS	SSS COSTS IN DOLLARS SSS	COST BREAKDOWN TOTALS	**************************************	CONSTANT DOLLARS
COST BOE LYDOWN STRUCTING MIMMER	COST BREAKDOWN STRUCTURE ELFMENT	TOTAL ADJUSTED COST	<pre><</pre>	PERCENTS OF TOTAL ADJUSTED COST
235368 235500 235500	DFPDT LEVEL MAINTENANCE INSTRUCTOR TRAINING AIDS		000	
30000	OPERATION AND SUPPORT OPERATION	30,883.107		17.3 66.8
317000	PERSONNEL FACILITIES	3,525.760		980
314000	ENTROY CONVINCTION EATERNAL TO CONSCIENT TO CONTRACT T	224+000		· · · ·
370000		22,814,347		
321100		1345.44.546	9.6	***
321110	O/I LEVEL (REMOVE & REPLACE)	958.000	~ · ·	
321130	DEPOT LEVEL (REPAIR)	535.937		
321200	REPAIR MATERIAL TRANSPORTATION AND PACKAGING	6,540,523	L. 41	
321310		2,773,590	0.0	
321.330	SHIPPING TAITAIAL SHIPPING	792 · 090	9 6 9	
322000	PAFVENTIVE MAINTENANCE	706.205		n. c
327200	MATERIAL	334.000		
323000	OVERHAUL	325,312		1.0
323700	LABOR	165,312	G G	
323300	TOANSPORTATION	000.04	0.0	
324000	SUPPORT & TEST EQUIPMENT MAINTENANCE	1.400.000		9 •0
325100	SHOP SPACE	0+40.524.1		7.*
325110	ט/ו ונאנו	940.000		
325120	DEPOT LEVEL	10440	0.0	
305.00			2.1	•
32520	DEPOT LEVEL	004.5	- G	
326000	DOCUMENTATION MAINTENANCE	80.000		~~0
327604		4.564.801	1	
327140	CIPELEXIONERY SPEEDS	100.505.4		
32400	_	000-640		
328100	80	56.00	•	
324200	3	000.49		
33000	TEDATASTON		•	4
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>		7 4 7 4 7		•

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DATE 11/ 1/76		SAMPLE COMPUTER RUN FOR NAVMAT FOUTPMENT LIFE CYCLE COST	HENT LIFE	CYCLE COST	HODEL		2	PAGE 11.001
\$\$\$ COSTS		GENERAL FUNDING REPORT	EPORT	**************************************	YEAR-1	.CONSTANT DOLLARS	DOLLARS***	•
COST OPE AKDOWN	·		30 0	BENERAL TYPE	of FUNDING		•	
NUMBER P	COST BREAKDOWN STRUCTURE ELEMENT	0 J	MENT	110N	3	SOMMEL	OTAFRS	TOTAL
	TOTAL LIFF CYCLE	3,980,00010,599,725	0.599.725	6,158,84019,543,624	9,543,624	6.258.843	•	046,461,033
100000	RESEARCH AND DEVELOPMENT	3.900.000	•	50,000	•	10,000	•	3,966,000
11000	VALTDATION	750.000	•	•	•	•	•	750.000
00011	CONTRACTOR	500,000	9 6	9 4	• •	• •	• •	500.000
12000	FILL SCALE DEVELOPMENT	3.150.000	•	50.000	•	10.00	•	3.210.000
121000	CONTRACTOR	2,325,000	•					2,325,000
121100		000.000	•	•	•	•	•	
121300	PROTOTYPE HARDLANE			•	, 4	•	•	900.009
121400	SOFTABLE	150,000	•	•	•	•	•	150,000
121500	TEST & EVALUATION	75,000	•	•	•	•	•	15.000
121400	•	150,000	•	•	•	•	•*	150.000
121760	CIEDUMI & TEST EQUIPMENT	350,000	0 (9 00 00	•		• •	
122100	TANAMAN MANAMAN		• •		•		•	850.000
122200	PHOTOTYPE TEST & EVALUATION	275,000	•	50.000	•	10.00	•	335,000
122210	ING	•	•	•	•	70.00	•	0000
122220	SITE ACT		•	50.00	•	•	•	50.00
122230	TEST & EVALUATION	275,000	•	•	•	•	•	275.000
200000	INVESTMENT	10	0,599,725	825,800	53,200	146.000	=	11.617.925
210000	GOVERNMENT PROGNAM MANAGEMENT	•	920.000	•		•	•	920.000
220000	PRIME FOULDMENT ACQUISITION	•	5,610,000	•	•	•	•	5.610.000
22200	PRODUCTION SUPPORT A SERVICES		980.000	7	•	•	•	350.000
223000	2		50.000	•	•	•	•	50.000
224000	z,	•	60.000	•	•	•	•	000.00
	INSTALLATION & CHECKOUT		150.000	906.354	606.568		•	390.450.4
231000	SUPPORT & TEST EQUIPMENT ACQUISITION	•	•				•	200,400
232000	SIIPPI Y SUPPORT	•	3,219,475	•	43.200	•	•	3.262,675
232100	INTITAL SPARES	•	3,219,475	e (•	•	•	3.2/9.475
232110	≒.	•	3,894,475	•	•	• •	•	3700000
21250	TAKANAN A TORIN ANTA ORDER ANTANAN ANTA		9994621	9 0	43.200	•	•	163.64 11.240
233000	!	•	• •	A25.000		•	•	825.000
233100	OPFRATIONAL	•	•	225,000	•	•	•	225.000
233200	HAINTENANCE	•	•	600.009	•	•	•	600.009
274060	DOCUMENTATION		300.250	•	•	•	• ·	300.250
24100	ACTURED OF STATEMENT OF STATEME	•		9 6		•	``	
235000	Ž	•	30.00	,	10.00	140.000	•	200.002
235100	90		•			10.00	1	50.00
235200	D/I LEVEL MAINTENANCE		•	•	•	75.000	•	75.000

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PAGE 11.002 130.483.107 CONSTANT BOLLARS.... OTHFRS PROCURE CONSTRUC- 0 & M SONNEL 0 5.283,84010,490,424 6.108,849 0 3.360,860 1.165,000 3.525,760 0 3.525,760 370.205 1,923,84818,397,424 2,583,080 011,597,412 2,072,874 0 535,937 2,072,676 15.00 1,346,795 360,567 336,888 10.00 10.00 336,000 3,98 535,93 2,773,59RASE YEARS! SAMPLE COMPUTER RIM FOR NAVMAT FQUIPMENT LIFE CYCLE COST MODEL 3,360,000 GENERAL FUNDING REPORT 0 1 THANK-ORTATION SUPPORT & TEST EQUIPMENT MAINTENANCE FACILITIES COST BREAKDOWN STRUCTURE ELEMENT 0/I LEVEL (REMOVE & REPLACE) 0/I LEVEL (REPAIR) 0EPOT LEVEL (REPAIR) RFDAIR MATERIAL THANSPORTATION AND PACKAGING MATERIAL MANDLING LABOR DACKAGING MATERIAL PFDLFNISHMENT SPARES SUPPLY SYSTEM MANAGEMENT DFPOT LEVEL MAINTENANCE INSTRUCTOR TRAINING AIDS 0/1 LEVEL REPOT LEVEL BOCCHMENTATION MAINTENANCE SUPPLY SUPPORT D/1 LEVEL MAINTENANCE OF DOT LEVEL MAINTENANCE CORPECTIVE MAINTENANCE PREVENTIVE MAINTENANCE MATFOTAL CONSUMPTION SOFTWARE MAINTENANCE O/I LEVEL NFPOT LEVEL INVENTORY STORAGE PFHSONNEL FACILITIES ENERGY CONSUMPTION OPERATING AND SUPPORT MATFHIAL MATFRIAL TERMINATION 855 COSTS IN DOLLARS 555 TPAINING OPERATION SUPPORT 0ATE 11/ 1/76 COST BAFAKDOWN STRUCTURE NIMBF® 2355400 235300 30000 110001

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DATE 11/ 1/76	92/1	SAMPLE C	SAMPLE COMPUTER RIM FOR NAVNAT FRUIPMENT LIFE CYCLE COST MODEL	NY FOUTPHENT LIFE	CYCLE COST MODEL		PAGE 12.001
151 COSTS	151 COSTS IN DOLLARS 555		ANNUAL COST (ANNUAL COST BY FIMDING TYPE			
			FUNDING TYPE	TYPE		SCOMBIANI DULLAN	TOWNIAN COLLANDONO
VFAR	c •	PROCUMEMENT	CONSTRUCTION	* * 0	MIL, PERSONNEL	OTHERS	TOTAL
_	3.960.000	975.608	50.00	•	10.00	•	. 036. 008
~	e	5.168.852	1.030.960	116,600	17.500	•	6.393.712
_	•	2,741,161	1.715.960	4.838.095	1.701.754	•	10.996.970
•	c	1,714,712	1.580.960	6,575,326	2,176,306	•	12.147.304
	•	•	1.680.960	0,013,803	2,293,284	•	11.980.047
TOTAL	3.404.000	10,599,725	6.158.840	19,543,624	6,258,843	•	46.461.033
							•

PAGE 12:001		*****	707	******	
		CONSTANT DOLLARSoone	MAIN- TENANCE	878.988 4.653.489 5.914.782	18.625.647
2		1 CONSTANT	OPERATION	150.000 2.377.360 2.874.260	8:275:760 18:625:647
E COST MODI		**************************************	SUPPORT		500.008
I LIFE CYCL			TECHNICAL DATA		380,250
IAT EQUIPMEN	BY COST CAT	EGORY	SUPPLY SUPPORT	175,000 2,616,000 2,014,320 2,270,022 1,866,132	7,845,476
TUN FOR NAVE	ANNUAL COST BY COST CATEGORY	· - COST CAT	tra in ing	684.500 78.550 78.550 76.000	353.900
SAMPLE COMPUTER RUN FOR NAVMAT EQUIPMENT LIFE CYCLE COST MODEL	•	THE THE THE TOTAL COST CATEGORY	Prine Foutphent	2.455.000 1.563.600 1.642.000	375,000 5,560,000
SAMPLE		1	TEST 146	4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	375.000
	588		PROBRAM . MANABEMENT	6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	1.720.000
1/76	555 COSTS IN DOLLARS 555		CONTRACTOR	2.525. 000. 000. 000. 000.	2.825.000 1,720.000
DATE 11/ 1/76	SSS COSTS	•	VEAR C	- ~ ~ »	TOTAL

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PAGE 14.001			CVCLE		1.6	7	-3.2	-	0	- a	֓֞֝֞֝֞֞֞֝֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓		•
30v4	CONSTANT DOLLARS		TOTAL LIFE CYCLE	46,441,033	43.961,033	44.461.033	45.461.033	45.961.033	46.461.033	47.461.033	47.961.033	48.461.033	55010400
•	• CONSTANT												
ă	7		•	•	:	•		0.0	•		•		
SAMPLE COMPUTER RUN FOR NAVNAT FOUIPMENT LIFE CYCLE COST MODEL	**************************************		\$ 1 0	30,863,167	30.463.107	30.083.107	10.663.167	30.883.187	10.0030.007	30.483.107	30.A83.107	30.483.187	
OUTPMENT LIF	ANAL YSTS	(IN24dInb3	HENT	٥.	-21.5	-17.2	9.9	m• •		9.6	6 P	21.5	•
FOR MANMAT	SENSITIVITY ANALYSIS	UIPHENT (\$/	COST ELEMENT INVESTMENT \$	11.617.925		10.117.925		11.117.925	12.117.925	12.617.925	13,117,925	13.617.925	
F. COMPUTER RUN		CONTRACTORS EQ	•	0.0	•••	<i>f</i>		e		0.0	•••		
SAMPL	•	MLE: Unit price of ome of the contractors equipment (\$/Equipment)	DEVELOPMENT S	3,968,808	3.960.000	3.960.000	3,960,600	3.060.000	3.960.000	3.960.000	3.960.000	3.968.000	
1/1/14	SSS CASTS IN BOLLARS SSS	SEMSITIZED VARIAALE! CI) UNIT PRICE O	VALUF	50.000.00	25.000.00	34.000.00	000.000	50.000.00	15.000.00	40.000.00	70.000.00	75.000.00	
DATE 11/ 1/74	118 CO	SENS LT I	SFE.	•	- ~	n ,	• •	• •	~ (E d	. =	=	

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SEN, NIM. O DENOTES BASE VALUES 8 -- PERCENT CHANGE FROM BASE VALUE

	SAMPLE COMPUTER RUM FOR MANMAT EQUIPMENT LIFE CYCLE COST MODEL	T LIFE CYCLE COST MODEL	PAGE 14.002
\$55 COSTS IN DOLLARS \$55	SENSITIVITY ANALYSIS		**************************************
SENSITIZED VARIABLE:	MEAN IIME RETWEEN FAILURES OF THE SPARE/AFPAIR ITEM (MR/ITEM	_	
SFN. NUM. VALUE	DEVELOPMENT SOST ELEMENT INVESTMENT S S S S S S	• 50 W	TOTAL LIFE CYCLE

TOTAL LIFE	46,461,033	67.617.799	55,528,218	51,754,224	46.461.033	44.537,690	41.578,702	39.408.777
	0.0	80.00	25.1	4.4 4.6	9	F 6 6	-13.5	-19.5
\$ 10	30,683,107	48-945-398	38.624.089	32,396,680	30.883.107	27.872.726	76,711,887	24.862.344
•		26.6						
INVESTMENT	11.617.925	14.712.400	12,944,129	11.961.756	11.617.925	11.102.179	10.903.816	10-586-433
	0.0	00	0.0		e c	0	e 0	0.0
Development 6	3.960.000	3.960.800	3.960.000	3.960.000	000.000. 0.000.000	3.960,000	3.950.000	3.960.000
VALUE	3.00	0.00	0 0	0.0	1.10	1.20	04.1	1.50
MUM.	•	- N 1	₹ •	ur. e	•	e 0	· 5	=

SEN. MIM. O DENOTES RASF VALUES 8 - PERCENT CHANGE FROM BASE VALUE

04TF 11/ 1/76			SAMPLE	F COMPUTER RUN		AVHAT EQUI	FOR NAVMAT EQUIPMENT LIFE	CYCLE COST	T MODEL		•	PAGE 14.003
115 COSTS IN DOLLARS 585	OLLARS	33			SENSI	SENSITIVITY ANALYSII	T VS I S	*******	YEAR	*COMSTANT	CONSTANT DOLLARS***	•
		*	HATRIX OF V	RIX OF VALUES FOR	THE SENSIT	IVITY ANAL	SENSITIVITY ANALYSIS OF VARIABLE	RIABLE R				
SPN. NUM. MULTIPLIER	•:	0.50	2 0.60	0.70	***	\$ 0.0	1.00	1.10	1.20	1.30	•••	1.50
ARRAY INDEX												
1	30.00	375.00	450.00	525.00	600.00	675.00	750.00	825.00	900.00	975.80	1050.00	1125.00
ď.	500.00	250.00	300.00	350.00	400.00	450.00	500.00	550.00	600.009	650.00	760.00	750.00
•	70.00	435,00	572.00	00.609	696.00	783.00	970.00	957.00	1044.00	1131.00	1214.00	1305.00
•	00.00	300.00	360.00	420.00	480.00	540.00	60.00	669.00	720.00	780.00	10.01 10.01	900.00
٠ د	50.00	125.00	150.00	175.00	200.00	225.00	250.00	275.00	300.00	325.00	350,00	375.00
•	00.00	200.00	240.00	2A0.00	320,00	360.00	400.00	440.00	480.00	520.00	560.00	00.009
4 4	00.00	300.00	360.00	420.00	480.00	540.00	600.00	660.00	720.00	780.00	00.010	900.006
•	00.00	450.00	540.00	630.00	720,00	810.00	900.006	990.006	1080,00	1170.00	1260.00	1350.00
•	50.00	175.00	210.00	245.00	280.00	315.00	350,00	345.00	420.00	454.00	496.00	525,00
E 62	50.00	175.00	210.00	245.00	280.00	315.00	350,00	345.00	420.00	455.00	490.00	525.00
- 11	50.00	175.00	210.00	245.00	280.00	315.00	350.00	345.00	420.00	455.00	490.00	525,00
12	50.00	175.00	210.00	245.00	280.00	315.00	350.00	365,00	420.00	455.00	490.00	525,00
13 7	00.00	350.00	420.00	490.00	560.00	630.00	100.00	770.00	940.00	910.00	980.00	1050.00
14 12	00.00	£00.00¢	720.00	840.00	960.00	1080.00	1200.00	1320.00	1440.00	1560.00	1680.00	1800.00
15 15	200.00	750.00	900.006	1040.00	1200.00	1350.00	1500.00	1650.00	1800.00	1950.00	2100.00	2250.00

SEN. MUM. O DENOTES RASE VALUES S. - PERCENT CHANGE FROM BASE VALUE

SSS COSTS IN DOLLARS SSS				INFLATED DOLLAPS****
		COST ELFMENT	: : : : : : : : : : : : : : : : : : : :	COST CATEBORY
COST CATERONY 1	DEVELOPMENT	Name	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	2.901.275			2,901,275
W OF COST ELEMENT TOTAL I	71.3			1
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	821.600	1.013.480		1,835,080
A DE COST CAFFGORY TOTAL I	- 0° 40°	55.0	• •	0.00C
				340.375
cost	9200	14.41	0.0	0.001
A OF COST ELFWENT TOTAL I		7.0	0.0	7.0
-		6+44+596	0	6.444.596
A OF COST CATEGORY TOTAL !	0°0	0.00%	000	0.001
TOTAL CONTRACT TOTAL CONTRACT	10.2501	217.050	171,482	3991668
	E . O	100		
SUPPLY SUPPORT		3,780,585	5,480,900	9,261,485
S OF COST CATEGORY TOTAL !	6.00	B 6 6 4	20.5	0.00
S OF COST ELFMENT TOTAL		Z8.5	8.4	
	0	310.777	92.780	403.557
4 OF COST CATEGORY TOTAL 4 OF COST ELEMENT TOTAL		77.0	83.0 0.1	0.00 7.0
CONTRACTOR OF THE CONTRACTOR O		. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
S OF COST CATEGORY TOTAL		0.001	9	0.001
. – .	•	D • 6	0.0	~
		250.575	9,733,315	0,683,690
		is to	97.5	0.00
# OF COS! ELEMEN! TGIAL			F*8)	**************************************
		468.200	21,578,507	102.246.707
& OF COST CATEGORY TOTAL W OF COST ELEMENT TOTAL			58.5	9.04
COST ELEMENT TOTAL	4.067.050	13,759,013	37,056,985	54.383.048

888 COSTS IN DOLLARS 888		SUMMARY	**************************************	. INFLATED AND DISCOUNTED
		COST ELEMENT		COST
COST CATFRORY	DEVELOPMENT !	INVESTMENT	310	TOTAL
	2.768.500 108.0 71.3	66	•••	2.768.500 100.0 7.0
	784.000 47.9 20.2	853,420 52,1	900	1,637,620
GOST CATEGORY TOTAL	318,600	47.950 13.1 0.4	99	9.00 9.00 9.00 9.00
	0.0	1 (90	5,238,260
	9.770	185,562	121,966	317,299
	0.0	3,073,237 44,3 28,0	3,871,233	6,944,470
		296,040	1 1.61	365.720
FRUIDHENT COST CATFROOY TOTAL COST ELFHENT TOTAL		0.001		0000
	000	210,300	6,922,267	7,132,567 100.0 17.3
MAINTENANCE B. DE COST CATEGORY TOTAL B. DF COST ELEMENT TOTAL	0.0	560, 500	13.308,045	15,666,075 100.0 100.0
COST ELFWFNT TOTAL 4 OF LIFE CYCLE COST	3,880,870	10,958,769	26,293,221	41.132.860

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APPENDIX E

FLEX Technique Sample Computer Run

FLEX Technique Sample Computer Run

This Appendix contains an example of a computer run provided for the user to show the flexible capabilities of the computer program to make changes in the basic NAVMAT LCC Equipment Cost breakdown structure and equations.

All the regular reports are available after the desired changes are implemented.

The following changes are requested:

A. Redefine the contractor costs during the full scale development.

Original format

Requested change

CS121000	Contractor	CS121000	Contractor
CS121100	Management	CS121100	Prime Contractor
CS121200	Engineering	CS121200	Other Contractor
CS121300	Prototype Hardware		
CS121400	Software		
CS121500	Test & Evaluation		
CS121600	Documentation		
CS121700	Support & Test Equipme	ent	

These changes can be implemented in more than two ways; however, the two basic ways to accomplish the changes are as follows:

- 1. Delete all of the cost elements under 'Contractor' one by one and then insert the cost elements for 'Prime Contractor' and 'Other Contractor'.
- 2. Delete the cost element 'Contractor' which automatically deletes all of the lower indenture level cost elements under Contractor, then Reconstruct the cost elements
 for 'Contractor', 'Prime Contractor', and 'Other Contractor'.

Because it requires fewer changes, in this example the second method is more preferred.

The following cards are prepared to be inserted in the associated files:

Prepare following cards for CS file

*(1) CS121000	(11)	(55)	(60)	(65)	(70)	(80) 1
CS121000 CS121100	CONTRACTOR PRIME CONTRACTOR	1~	1	1	1	-
EQ121100 CS121200	DPC(I);I,1,Y OTHER CONTRACTOR	1	1	1	7	
EQ121200	DOC(I);I,1,Y	1	1	1	1	

* Numbers in parentheses indicate the starting column number of the entries.

Note that since CS121000 'Contractor' cost element is not the lowest indenture level no input to describe the cost category, funding type, inflation type is provided, and there is no equation defined for it. The cost of this cost element is the summation of the costs of the cost elements below it.

Because new variables are introduced to define the equations, these values should be described (optional) and values must be entered thru NV file.

Prepare following cards for NV file

(1)(5) (16)

DS DPC(I) Payment By Government To Prime Contractor For Full Scale

DS DPC(I) Development Effort During Year I (\$/yr)

NV DPC(Y) 2500000,4*0.

DS DOC(I) Payment By Government To Other Contractors for Full Scale

DS DOC(I) Development Effort During Year I (\$/yr)

NV DOC(Y) 750000,4*0.

B. Revise the equation for the initial spares for prime equipment (CS232110). Write an equation that provides a thru put by year.

Prepare following cards for CS file

(1) (11) (70) CS232110 1 EQ232110 ISP(I);I,1,Y

Note that a CS Card is necessary to indicate that there is a change requested in this cost element equation.

Prepare following cards for NV file

(1)(5) (16)

DS ISP(I) Acquisition Cost of Prime Equipment Initial Spares (\$/

DS ISP(I) yr)

NV ISP(Y) 0,500000,3*0.

C. Redefine the funding type and the inflation factor type of the 'Operation and Supply' facilities from MILCOM to O&M.

Prepare following cards for CS file

(1)	(60)	(65)
CS312000	4	4
CS325110	4	4
CS325120	4	4
CS325210	4	4
CS325220	4	4

D. Change the description of CS327200 from 'Supply System Management' to 'Inventory Management'.

Prepare following card for CS file

- (1) (11) CS327200 INVENTORY MANAGEMENT
- E. Separate termination costs from the operating and support costs, define a new major cost element for "term-ination' costs, and assign the value of this cost to the last year of the analysis period. Remove termination costs from maintenance cost category and define a new cost category for 'Termination'.

Prepare following cards for CS file

(1)	(11)	(55)	(60)	(65)	(70)	(80)
CS330000						1
CS400000	TERMINATION					
CS410000	SALVATION	11	2	2	1	
EQ410000	SALV;I,Y,Y					
CS420000	DISPOSAL.	11	4	4	1	
EQ420000	DISP;I,Y,Y					

Prepare following cards for NV file

(1) (5) (16)

DS SALV Salvation cost of the Prime Equipment (\$)

NV SALV - 250000.

DS DISP Disposal cost of the Prime Equipment (\$)

NV DISP 300000.

Changes requested in the major cost element heading and cost category name should be done thru the NAMELIST Input Data file.

Prepare following cards for NAMELIST data file

(2) ELT4='TERMINAT','ION', CAT11='TERMINAT','ION',

F. Identify life cycle cost years in four character alpha-numeric presentation.

Prepare following card for NAMELIST data file
(2)
YEARS='FY77','FY78','FY79','FY80','FY81',

Through deletion and changes of the equations, some of the built-in variables are no longer needed for computational purposes. These variables don't require input values. These variables are:

From change 1.

DCPM(I), DCE(I), DCH(I), DCS(I), DCTE(I), DCD(I),
DCST(I)

From change 2.

FPST, FILS, FIRT, FDRT

From change 4.

NPO(I), TERM

Since a variable may be used more than one cost element equation these changes should be checked for verification by using table V.2 presented in the documentation.

SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVNAT LCC MODEL

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ANALYSIS IDENTIFICATIONS

PAGE 1.001

INPUT DATA LISTING AND ERROR DIAGNOSTICS

	DEPARTMENT COST MANAGEWENT DIVISION. DATA IS PHOVIDED FOR SAMPLE PURPOS	DEPARTMENT COST HANAGEVENT DIVISION. DATA IS PHOVIDED FOR SAMPLE PURPOSE ONLY AND SHOULD NOT ME USE AS A RASE FOR INTERPRETATION FOR ANY PROJECT.		-	
	S PROVIDED FOR S	AMPLE PURPOSE ON Ion for any proj			
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	MASHINGTON. D.C.	20374			
_	PHONE 202-433-4084	**			
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PRINCE		- CHARKE	0919140		
RAPs. 13.	80M=100.	A1E=100.	#14=100·	RO=7.67.	
RPL=1.0.	RPME.5.	RSD=17.22	KSL=7.87.	ASR 104.	
STEH=.25.	STES=5000.		•		
NAB.					
NPH 100.600.					
LPM=0.15.					
MPN=50.150.					
NK#15.					
CST=750.1200.5	900.4200.1700.2*	CST = 750.1200.5000.4200.1700.2=3500.9000.4 + 500.2 2500.6000.	2"2500,6000,		
DC=4*.75,1.3*.75,7*1,	75.701.			•	
DSC=12.2*.1.01.0.A*.1.	01.0.0.1.				
LSD=0.7.18.6.0	LSD=0.7.18.6.0.9.6.20.4+5.10.5.15;	.15.			
151=0.5.12.4.8	151=0.5.12.4.8.6.5.15.4*3.7.3.11.	11.			
L.50=3.2.1.A.2.	L_S0=3.2.1.A.2.6.4.2#314.4#2.4.1.3;	1.3.			•
afY=2.4.1.3.6.	1,2,1,4,2,3,1,				
R=750.500.870.	500,250,400,600,	8=750:500.870:600.250:400:600:900:4*350:700:1200:1500:	00.1500.		
BSS=11.81.71.5	#SS#1875.1A61.9.4*.851.51.71.41	50.50.70.40			
RW=15+1.25.					
N=75,100,170,3	10.250.190.300.5	W#75.100.170.300.250.190.300.50.600.450.275.310.140.260.700.	0+140.260.780.		
Y=5.					
AD=300000.4.0.					
ADC=500000.4+0.					
ADG=250000.4*0*				-	
ATURS0000 - 4 - 0 -					
CS=2+0+3+15000+					
DGPH#550000.4.00.					
DGTA#50000.4.0.					3
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PAGE 1.002

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E=8

PAGE 1.003

SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAYHAT LCC HODEL

DATE 11/ 1/76

IMPUT DATA LISTING AND EARDR DIAGNOSTICS

De IMPLIT STATISTICS CON 79 CARDS READ A FEDDRE

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		8 A	8 ≥		2	S	S 0	₹	S	S 0	2

SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVNAT LCC MOREL IMPUT DATA LISTING AND ERROR DIAGNOSTICS INVENTORY MANABEMENT CONTRACTOR PRIME CONTRACTOR DPC(1) 11:1:Y OTHER CONTRACTOR DOC(1) 11:17 TERMINATION SALVATION SALVII • Y • Y DISPOSAL DISP II • Y • Y ISP(I) I I . I . Y 0ATE 11/ 1/76

PASE 1,005

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235208	O/I LEVEL MAINTENANCE	619	-	010	•	-	-		-			
235300	DFPOT LEVEL MAINTENANCE	T T		<u>.</u>	•	-	-	-	>			
235400	TASTRUCTOR	919	-	G T P	•	-	-	_	>			
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435500	TREINING ALDS	ATU	-	-	-	_	>					
300003	OPERATION SUPPORT OPERATION											
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315000	SOFTWARE MAINTENANCE	z (. .	₹ -	• •	5 -	• \$	-		-	-	
320000	SUPPORT CORPECTIVE MAINTENANCE	3	•	-	• •	•	•			•		
321110	DAT LEVEL (REMOVE & REPLACE)	2	_	10	•	ä	¥	•	414	×	•	
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DATE 11/ 1/76	SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVNAT LCC MODEL	TER RUN F	OR FLEX	TECHNIQUA	E OF NAVN	IAT LCC M	ODEL				PAGE 2.003	
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Breakdown Structure Numbe	COST BREAKDOWN STRUCTURE ELEMENT	+		÷		g.	FOUATION					
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DATE 11/ 1/76		SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL	EN FOR	FLEX T	ECHNI QUÉ	OF NAVR	AT LCC N	13gor			•	PÀGE 2.0
COST BREAKDONN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	ELEMENT		FOUA	EQUATIONS		i.	FOUATION				
325000 325100 325110	FACTLITIES Shop space 0/1 Level	:	į	•	•	•			•	:		
325120			USSH USSD		0 5 0	• •		-		-		
325200 325210	INVENTORY STORAGE 0/I LEVEL		1551	•	ī	•	_	-	-	>		
32520	DEPOT LEVEL	•	0881	. .	CSD	•	· -			· >		
327000		z	<u>.</u>	A C	•	-	-	IVI	>			
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327200	INVENTORY RANABEMENT TRAINING	, z	MSN	N N N N N N N N N N N N N N N N N N N	- •	. I	. .		. –		ž >	
324200 324200	OPFHATOR O/T LEVEL MAINTEMANCE	. ب	9 :	- .	# Y	• .	010	• •		.		> ;
324300	DEPOT LEVEL MAINTEMANCE	<u>د</u> د	5 9		E 44		E 6	• •				
◆00000	TERMINATION Salvation	G	A 145	_	-	>	>					
420000	DISPOSAL		0159	. <u>-</u>		· >	· >					

PASE 2.005

REMARKS

THIS PROGRAM IS RASED ON COST ALGORITHINS PROVINED BY THE NAVAL WEADON'S ENGINEERING SUPPORT ACTIVITY HANAGEMENT ENGINEERING DEPARTMENT COST MANAGEMENT DIVISION.

DATA IS PROVIDED FOR SAMPLE PURPOSE ONLY AND SHOULD NOT 'RE USED AS A BASE FOR INTERPRIATION FOR ANY PROJECT.

QUESTIONS FOR INTERPRETATION OF INDUT DATA OR LCC PHILOSOPHY SHOULD RE DIRECTED TO ALBONING FOR INDUT DATA OR LCC PHILOSOPHY SHOULD RE DIRECTED TO ALBONING ENGINEEHING SUPPORT ACTIVITY ESA-A431 WASHINGTON NAVY YARD WASHINGTON D.C. 20374

PHONE 202-433-4084

				•
		MAMES. DESCRIPTIONS. DIMENSIONS. AND VALUES OF BUILT-IN VARIABLES		
Y Y Y		NOT LEI MONTE LE		
Ę	300.000.00	ACQUISITION COST OF DATA DURING INVESTMENT PERIOD (S/VEAR). 0.00 0.00 0.00 0.00		
400	(5) 400.000.00	GOVFRWMENT PAYMENTS TO THE CONTRACTOR FOR TECHNICAL AND MNAGERIAL WORK PERFORMED DURING VALIDATION PHASE . 6.00 0.00 0.00	E (\$/YEAR)	EARI
AOA	(5)	ROVERNMENT EXPENDITURES FOR TECHNICAL AND NANAGERIAL WORK PERFORMED DURING VALIDATION PHASE (S/YEAR) 0.00 0.00 0.00		
12	50,000,00	ACQUISITION, TRANSPORTATION, AND INSTALLATION COSTS OF TRAINING AIDS AND DEVICES DURING INITIAL TRAINING . 0.00 0.00 0.00	3 (S/YEAR)	EARI
¥	1.00	BASE YEAR DURING/FROM WHICH ALL COST ADJUSTMENTS ARE MADE DIMENSIONLESS	,	
3	2.00	ENERGY CONSUMPTION COST INCURRED DUAING THE OPERATION OF THE PRIME EQUIPMENT (S/MR/EQUIP.)		
CIPE	1.500.00	INSTALLATION COST OF THE PRIME EQUIPMENT (\$/EQUIP.)		
3	0.50	COST OF MATERIALS CONSUMED DURING THE OPERATION OF THE PRIME EQUIPMENT (\$/MR/EQUIP,)		
8	0.05	AVERAGE COST PFR PAGE OF SET-UP, RFPRODUCTION AND DISTRIBUTION OF TECHNICAL MANUALS (8/PAGE/COPY)		
ន	00.0	SOFTWARE MAINTENANCE COST DURING PRIME EQUIPMENT OPFRATION (S/YEAR) 0.00 15.000.00 15.000.00 15.000.00		
CSD	2.40	AREA COST FOR DEPOT LEVEL MAINTENANCE (\$/50. FT./YEAR)		
CST	240.00	ARFA COST FOR O/1 LEVEL MAINTENANCE SPACE (\$/59, FT./YEAR)		
CSO	240.00	AREA COST FOR OPERATIONAL SPACE (\$/59. FT./YEAR)		
CST	(15) 750.00 500.00	UNIT COST OF THE KIM SPARF/REPAIR ITEM (\$/ITEM) 1.200.00 5.000.00 4.200.00 1.700.00 3.500.00 3.500.00 9.000.00 500.00 5.00.00 2.500.00 2.500.00 6.000.00	ø	500.00
113	1.000.00	AVFRAGE INSTRUCTOR TRAINING COST FOR PERSONNEL PAY & ALLOWANCE TRAVEL AND COURSE FEES (S/STUDENT)		

DATE	DATE 11/ 1/76	SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL	4°005
		NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES	
HAME			
47	756.00	average o/1 maintfwance personnel training cost for pay & allowance, travel and course fees (\$/Student)	
C40	300.00	ð	
64.0	1.500.80	AVERAGE DEPOT MAINTENANCE PERSONNEL TRAINING COSTS FOR BAY & ALLOWANCE: TRAVEL AND COURSE FEES (\$/STUDENT)	_
CTPE .	00.00	TRANSPORTATION COST OF PRIME EQUIPMENT FROM CONTRACTORS FACILITY TO INSTALLATION SITE (\$/EQUIP.)	
. 3	58.000.00	UNIT PRICE OF ONE OF THE CONTRACTORS EQUIPMENT (S/EQUIPMENT)	
2	(15) 0.75 1.00	DUTY CYCLE OF THE KTH SPARE/FEPAIR ITEM (RATIO) 0.75 0.75 0.75 1.00 0.75 0.75 1.00 1.00 1.00	
100	65.000.005		
0674	40.000.00	GOVERNMENT COSTS FOR TEST SITE ACTIVATION/DEACTIVATION DURING FULL SCALF DEVELOPMENT TAE PROGRAM (\$/YEAR)	-
DETE	1 51	GOVERNENT PERSONNEL COSTS INCURRED DIRING FULL SCALE DEVELOPMENT TLE PROGRAM FOR TESTING & EVALUATION S SYVEAR 0.00 0.00 0.00	YEAR)
DATT	10.000.00	GOVERNMENT COST TO TRAIN STUDENTS JURING FULL SCALE DEVELOPMENT TEST & EVALUATION PROGRAM (\$/YEAR) 0.00 0.00 0.00	
8	6 5).	ANWUAL DISCOUNT RATE FOR FUTURE COSTS (RATIO) 0.10 0.10 0.10 0.10	
980	151 1.00	DISCAND RACE OF THE WIN ITEM (RAFIO) 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.	0.10
£ .	9.12	REPAIR MATERIAL RATE (RATIO)	
Ž		WAINTENANCE SITE CONSTRUCTIOW/PREPAPATION COSTS DURING INVESTMENT PERIOD (S/VEAR)	
L 08	6.00	OPERATIONAL SITE CONSTRUCTION/PREPARATION COSTS DURING INVESTMENT PERIOD (S/VEAR) 150.000.00 75.000.00 0.00 0.00	
•	•	e e e e e e e e e e e e e e AEAD ARRAY VALUES FROM LFFT TO RIGHT e e e e e e e e e e e e e e e e e e	•

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		MAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES		
444		DESCRIPTION		
2	÷	RELIABILITY IMPROVEMENT OR DEGRIDATION FACTOR (DIMENSIONLESS)		
19001	÷.	ANMIAL INFLATION RATE FOR FITTUME COSTS FOR CONSTRUCTION IYPE OF FUNDING (RATIO) 0.06 0.06 0.06	·	
1001		AMMIJAL INFLATION RATE FOR FUTURE COSTS OF OLM TYPE OF FINDING (RATIO)		
IRPROC	. s.	AMMIAL INFLATION RATE FOR FUTURE COSTS OF PROCUREMENT TYPE OF FUNDING (RATIO)	•	-
1880	6.05	ANNIJAL INFLATION RATE FOR FUTURE COSTS OF RAD TYPE OF FUNDING (RATIO) 0.05 0.05 0.05 0.05		
0SS1	, s.	STORAGE SPACE REQUIRED FOR THE DEPOT INVENTORY (SO. FT./YEAR) 250.00 250.00 250.00 250.00	٠	
1881	0.00	STORAGE SPACE REQUIRED FOR THE O/I INVENTORY (SQ, FT,/YEAR)		
141	2.00	YEAR DURING WHICH INITIAL COST OCCUR (DINENSIONLESS)	•	
5	50.00	DESIMED MANNING LEVEL FOR OPERATING PERSONNEL (PERSONNEL/VEAR)		
5	00.00	DESTRED MANNING LEVEL FOR D/1 LEVEL MAINTENANCE PERSONNEL (PERSONNEL/YEAR) 0.00 80.00 100.00 100.00		
5	6.00	DESTRED MANNING LEVEL FOR DEPOT LEVEL MAINTENANCE PERSONNEL (PERSONNEL/VEAR) 0.00 10.00 10.00		
H4-1	9.00	PRFVFNTIVE MAINTENANCE LABOR TIME FOR NTH MAINTENANCE ACTION (MR/ACTION) 15.00		
780	6 15) 0.00 5.00	DEPOT MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (MAZITEM) 7.00 18.00 6.00 20.00 5.00 10.00 5.00 15.00		•
151	0.00	0/1 LEVEL MAINTENANCE LABOR TIME TO REPAIR THE KTH ITEM (HP/ITEM) 5.00 12.00 4.00 8.00 6.09 5.00 15.00 3.00 7.00 3.00 11.00	••	3.0
087	3.00	O/I LEVEL MAINTEMANCE LABOR TIME TO REMOVE AND REPLACE THE KTH ITEM (MR/ITEM) . 2.00 1.80 2.60 4.00 3.00 3.00 3.00		~

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•	DATE 1	DATE 11/ 1/76	SAMPLE COMPUTER RIM FOR FLEX TECHNIQHE OF NAVNAT LCC MODEL	
_			NAMES, DESCRIPTIONS, DIMENSIONS, AND VALUES OF BUILT-IN VARIABLES	
	3446		DESCRIPTION	
	1 1	50.00	MATERIAL COST FOR WIN TYPE OF PREVENTIVE MAINTENANCE ACTION (SZACTION) 150.80	
	488D	6.00	SMOP SPACE REQUIRED FOR DEPOT LEVEL MAINTENANCE (SQ. FT./YEAR) 150.00 150.00 150.00 150.00 150.00	
	1554	00.00	SMMP SPACE REQUIRED FOR O/1 LEVEL MAINTENANCE (SQ. FT./YEAR) 1.000.06 .000.06 .000.00 .000.00	
_	2	0.00	NUMBER OF EQUIPMENTS IN THE NAVY'S INVENTORY SYSTEM (EQUIP./YEAR)	
_	õ	00.0	NUMBER OF COPIES OF TECHNICAL DATA TO BE DISTRIBUTED AND INVENTORIED (COPIES/YEAR) 25.00 0.00 0.00 0.00	
_	ž.	č	TOTAL NUMBER OF SPARE/REPAIR ITEMS IN THE PRIME EQUIPMENT (DIMENSIOMLESS)	
	I	٩	TOTAL NUMBER OF PREVENTIVE MAINTENANCE TYPES OF THE PRINE EQUIPMENT (DIMENSIONLESS)	
	ž	6.00	PRILE EQUIPMENT ANNIAL ACCEPTANCE SCHFOULE (EQUIP./YEAR) 50.00 30.00 20.00 0.00	
	HON.	0.00	PRIME EQUIPMENT OVERHAUL SCHEDULE (FQUIP./YEAR) 0.00 0.00 0.00 0.00	
	<u> </u>	200.00	NIMMER OF PAGES PER TECHNICAL MANUAL MAINTAINED BY NAVY (PAGES/COPY)	•
	Z Z	100.00	TIMF RETWEEN INSPECTIONS OF THE PREVENTIVE MAINTENANCE ACTIONS (MR/ACTION)	
	MSN	75.00	TOTAL NUMBER OF NEW MATIONAL STOCK NUMBERS TO BE ISSUED ON THE PRIME EQUIPMENT (MSN)	
	SNSN	350.00	TOTAL NUMBER OF NEW NATIONAL STOCK NUMBERS TO BE ISSUED ON THE PECULIAR SLTE EQUIPMENTS (NSN)	
	JH0	120.00	PRIME EQUIPMENT OVERHAUL MAINTENANCE LABOR TIME (MR/EQUIP.)	
	1	1.500.00	PRIME EQUIPMENT OVERHAUL MAINTENANCE MATERIAL COST (S/EQUIP.)	
	DHQ.	400.00	PRIMF EQUIPMENT OVERHALL MAINTENANCF MATERIAL SMIPPING RATE (\$/EQUIP.)	

. READ ARRAY VALUES FROM LEFT TO RIGHT .

1.600.00 (5) GOVERNENT PROJ. 0.00 650.000.00 250.00 (5) PRODUCTION SUPP. 0.00 350.000.00 (5) NUMBER OF INSTR. 0.00 50.00 (5) NUMBER OF OPERA 0.00 15.00 (5) NUMBER OF OPERA 0.00 15.00 (5) NUMBER OF OPERA 0.00 2.00 (15) NUMBER OF OLD OPERA 0.00 2.00 (15) NUMBER OF SO.00	Z			
1.600.00 (5) GOVERNMENT PROJEC 8.00 650.000.00 270 1.00 NUMBER OF PERSONN (5) PRODUCTION SUPPOR (5) PRODUCTION TEST & (5) PRODUCTION TEST & (5) NUMBER OF INSTRUC (5) NUMBER OF OPERATI 0.00 15.00 (5) NUMBER OF OLI MAI (15) NUMBER O	F			
1.600.00 (5) 600/EDMENT PROJEC 8.00 1.00 FLOOR SPACE REQUI 50.00 (5) PRODUCTION SUPPOR (6) PRODUCTION SUPPOR (7) PRODUCTION SUPPOR (6) PRODUCTION SUPPOR (7) PRODUCTION SUPPOR (7) PRODUCTION SUPPOR (7) PRODUCTION SUPPOR (7) P				
S 600 FENNENT PROJECTO 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.0	ANNUAL OPERATING TIME (MR/YEAR)			
1.00 1.00 5.00 6.50 0.00 3.0.006.00 6.50 0.00 1.50 0.00 0.0	GOVERNMENT PROJECT MANAGEMENT COSTS INCURRED DURING INVESTMENT PERIOD (S/VEAR 650.000.00 270.000.00 0.00			
FLOOR SPACE REGUI (5) PRODUCTION SUPPOR 0.00 350.000.00 (5) NUMBER OF INSTRUC 0.00 15.00 (5) NUMBER OF OVI MAI 0.00 50.00 (5) NUMBER OF OPERATI 0.00 50.00 (5) NUMBER OF DEBOT M 0.00 150.00 2.00 2.00 2.00 2.00 1.15) MEAN TIME BETWEEN 750.00 350.00	NUMBER OF PERSONNEL REGUIRED TO OPERATE A PRIME EQUIPMENT (PERSONNEL/FRUIP.)			
(5) PRODUCTION SUPPOR (5) PRODUCTION TEST & (5) PRODUCTION TEST & (5) NUMBER OF INSTRUC (5) NUMBER OF O/I MAI (5) NUMBER OF O/I MAI (5) NUMBER OF OPERATI (5) NUMBER OF DEPOT M (5) NUMBER OF DEPOT M (15)	RED FOR THE OPERATION OF A PRIME EQUIPMENT (SQ. FT./FOUIP.)			
(5) PRDDICTION TEST 6 0.00 50.000.00 (5) NUMBER OF INSTRUC 0.00 15.00 (5) NUMBER OF OPERATI 0.00 50.00 (15) NUMBER OF OPERATI 0.00 10.00 (15) NUMBER OF QUANTIT 2.00 2.00 (15) MEAN TIME BETWEEN 750.00 350.00	PRODUCTION SUPPORT & SERVICES COST INCURRED DURING THE INVESTMENT PERIOD (S/YEAR) 350.000.00	- 64		
(5) NIJMPER OF INSTRUC 0.00 15.00	EVALUATION COSTS INCURRED DURING THE INVESTMENT PERIOD 4 8/YEAR 0.00	~ &		
(5) NUMBER OF 0/1 MAI 0.00 50.00 (5) NUMBER OF OPERATI 0.00 10.00 (15) NUMBER OF QUANTIT 2.00 4.00 2.00 4.00 7.00 7.00 7.00 7.00 7.00 7.00	RECEIVE INITIAL TRAINING (STUDENT/YEAR)			
(5) NUMBER OF OPERATI 0.00 50.00 0.00 10.00 (15) NUMBER OF DEPOT M 2.00 4.00 2.00 4.00 7.00 7.00 (15) MEAN TIME BETWEEN 750.00 350.00	NTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR 30.00 20.00 20.00	•		
(15) (15) (15) (15) 750.00	NG PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR) 30.00 20.00 0.00			
(15) NUMBER OF QUANTIT 2.00 2.00 2.00 (15) MEAN TIME BETWEEN 750.00 350.00	NUMBER OF DEPOT MAINTENANCE PERSONNEL TO RECEIVE INITIAL TRAINING (STUDENT/YEAR 10.00 0.00 0.00	â		
(15) MEAN TIME BETWEEN 750.00 350.00	IES OF A SPARE/REPAIR ITEM (QUANTITY/ITEM) 1,00 3.00 6.00 1.00 1.00	0	% · ·	2.00
	S OF THE SPARE/REPAIR ITEM (HR/ITEM) 600.80 250.00 400.00 600.00 1.200.00 1.500.00	960.00	356.00	354.00
MAM O.40 OPERATOR AND U/I LEVEL MATE	LEVEL MAINTENANCE PERSONNEL ATTRITION RATE (RATIO)	٠		
MAP DEPOT LEVEL MAINTENANCE PEI	ENANCE PERSONNEL ATTRITION RATE (RATIO)			
RDW 100.00 TECHNICAL DATA MANAGEMENT	NAGEMENT COST FOR FILE MAINTENANCE (S/PAGE/YEAR)			

140	OATF 11/ 1/76	SAMPLE COMPUTER RUN FOR FLEX TECHNIOUE OF NAV4AT LCC MODEL	PAGE	4.006
		NAMES, DESCRIPTIONS, DIMENSIONS, IND VALUES OF BUILT-IN VARIABLES		
MAN		. DESCRIPTION		
316	100.00	AVFDAGE NATIONAL STOCK WILMER INSN) ENTRY COST INTO THE SUPPLY SYSTEM : SZNSN)		
2	100.00	SUPPLY SUPPORT MANAGEMENT ITEM RETENTION AND FIELD ADMINISTRATION COST (S/NGM)		
9	7.87	PRIME EQUIPMENT OPERATOR MOURLY PAY RATE (S/HR/OPFRATOR)		
B PL	1.00	PACKAGING LABOR COST (\$/LR.)		
3. 3.	0.50	PACKAGING MATERIAL COST (S/LB.)		
GSB	17,22	DEPUT MAINTENANCE PERSONNFL PAY RATE TO REPAIR FAILFO ITEMS (\$/HR/WAN)		
#SF	7.87	O/I MAINTENANCE PFRSONNEL PAY RATE TO REMOVE. REPLACE OR REPAIR FAILED TTEMS (S/HR/MAN)		
R SR	0.10	AVEGAGE SHIPPING COST (4/LR.)		
A SS	(15) 1.00 0.85	FRACTION OF FAILURES REPAIRED AT THE INTERMEDIATE MAINTENANCE LEVEL FOR THE KTH ITEM (RATIO) 0.80 0.70 0.50 0.70 0.40 0.85 0.50 0.70 0.40		0.85
r ar	(15) 1,25 1,25	RAITO OF THE SHIPPING "EIGHT IO THE UNPACKED WEIGHT OF THE KTH ITEM (PATIO) 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25		1.25
STE	500.000.005	SUPPORT & TEST FRITPMENT ACRITISITION COST (4/YEAR) 0.00 0.00 0.00 0.00		
STEY	0.25	SUPPOHT & TEST EQUIPMENT INITIAL SUPPORT RATE, PERCENT OF SLIE ACQUISITION COST (RATIO)		
5725	5.000,00	SUPPORT & TEST EQUIPMENT RECURRING SUPPORT COST PER PRIMEERUIPMENT (S/EQUIP.)		
3	(15) 75.00 275.00	UNPACKED WEIGHT OF THF KTH ITFM (LR./ITEM) 100.00 170.00 300.00 50.00 600.00 310.00 140.00 260.00 700.00	•	450.00
>	un.	NUMAFA OF YEARS COVERED BY THE LIFE CYCLE ANALYSIS (DIMENSIONLESS)	>	

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SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVNAT LCC MODEL 047E 11/ 1/76

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PAGE 5.001

USER DEFINED SCALARS

SCALARS

DESCRIPTION
DISPOSAL COST OF THE PRIME EQUIPMENT (\$)
300.000.00

SALV SALVATION COST OF THE PRIME EQUIPMENT (S)

200.5		: •
SAMPLE COMPUTER NUN FOR PLEX TECHNIQUE OF NAVNAT LCC MODEL	DESCRIPTION PAYMENT BY GOVERNMENT TO DTHER CONTRACTORS FOR FULL SCALE DEVELOPMENT EFFORT DURING YEAR I 1 \$/YR } PAYMENT BY GOVERNMENT TO DRIME CONTRACTOR FOR FULL SCALE DEVELOPMENT EFFORT DURING YEAR I 1 \$/YR } ACQUISITION COST OF PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{coursition Cost of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$\text{constant of PRIME EQUIPMENT INITIAL SPARES 1 \$/YR } \$	
DATE 11/ 1/76	MAME DOC (5) DOC (5) 2.500.000.00 1.5P (5)	

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PAGE 6.001	•	DISCOUNT FACTORS		950.0	99.0	0.789	0.717	0.652	•
		2	¥.	0.477	0.433	. A 9 .	0.050	0.811	••••••
1300		INFLATION AND DISCOUNT FACTORS	PROCUREMENT CONSTRUCTION	0.982	946.0	915	0.879	0.847	**************************************
SAMPLE COMPUTER RUM FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL	S	INFLATION AND	PROCUREMENT	0.984	0.059	6.933	0.004	6.001	ADJUSTMENT FA
X TECHNIQUE OF	COST ADJUSTMENT FACTORS		8	0.980	0.939	106.0	194.0	0.820	THE SAME COST
H PUN FOR FLE	COST ABJ		# #	1.025	1.076	1.130	1.107	1.246	FUNDING USES
SAMPLE COMPUTE		FACTORS	CONSTRUCTION	1.030	1.092	1.157	1.227	1.300	IRY PERSONNEL
		INFLATION	PROCURÉMENT	1,035	1,107	1.105	1.268	1,357	**************************************
1/1			9	1.027	1.004	1.144	1.207	1.273	•
0ATE 11/ 1/76		YEAR		2477	F 7 7 8	211	# × #	4491	

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. PAGE 7.002	ă	CATEGORY 1 TOTAL	0.00.0	150.020.44
HODEL .	**************************************	TERMINATION	10.00 10.00 10.00 10.00	
SAMPLE COMPUTER RUN FOR FLEX TECHNIONE OF NAVNAT LCC MODEL	•	\$10	• •	30,862,307
R RUM FOR FLEX TECHA	SUMMARY COST ELEMENT	INVESTMENT	000	9,022,750
SAMPLE COMPUTE		DEVELOPMENT		4.885.000
175 11/ 1/76	IS COSTS IN BOLLARS \$58	CAST CATEGORY	RHINATION 6 OF COST CATEGORY TOTAL 6 OF COST ELEWENT TOTAL	COST FLEWENT TOTAL. ** OF LIFE CYCLE COST

7.002

6v0E 0.001	4888888	CATEGORY	3.750.000	1.720.000	0.000	0.000 1000 1000 1000 1000 1000 1000 100	353.900	5.229.501	340.250		100.0	16.625.647
	CONSTANT DOLLARSeeve	OTHERS	• • • •		999	000	999				00	900
13GOI	YEAR=FY77	HIL. PERSONNEL!		• • •	00	0.0	290.000				3.525.760 42.6 56.3	2,443,083
SAMPLE COMPUTER AUN FOR FLEX TECHNTAUE OF NAVNAT LCG MODEL	• • •	X 3 0		000	600		13.00	4.504.501	80,000	000	1 4.525,000	15.582.564 83.7 62.1
A FLEX TECHNIQUE	FUNDING VS. COST CATEBORY FUNDING TYPE	CONSTRUCTION !			50,000	000				00	225,000	- 2.6
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047€ 11/ 1/76	SES COSTS IN DOLLARS SSS			PROGRAM MANAGEMENT 6 OF COST CAFFORM TOTAL 6 OF FUNDING TYPE TOTAL			TRAINING S. OF COST CATEGORY TOTAL S. OF FUNDING TYPE TOTAL		RY TOTAL	SUPPORT FOURPENT S OF COST CATEGORY TOTAL! F OF FUNDING TYPE TOTAL	OPERATION S. OF COST CATEGORY TOTAL! S. OF FUNDING TYPE TOTAL	MAINTENANCE M. OF COST CAFEGRAY TOTAL SOF FUNDING TYPE TOTAL

PAGE 6.682	<u> </u>	TOTAL	0 -250.000 n 300,000 n 6.0 50.000 n 6.0 100.0 n 6.0 100.0 n 6.0 n 6.	6 44.620.057 0.0 14.620.057
	CONSTANT	OTHERS		
HODEL	GOOGE ALL OF THE	MIL. PERSONNEL!	• •	6,256,643
IE OF NAVHAT LCC	_ •	2 0	300,000	875.400 25.105.964 2.0 25.105.964
R FLEX TECHNIQU	FUNDING VS. COST CATEBORY	CONSTRUCTION	00	
§ SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVNAT LCC MODEL	. FUNDING VS. COST CATEGORY.	PROCUREMENT CONSTRUCTION O & M MIL. PERSONNEL!	-250,000	1 7.755.250 1
SAMPLE	1 1 1 1	0 1 8	0 0	4.825.000 10.8
DATE 11/ 1/76	445 COSTS IN DOLLARS 555	COST CATEBORY	TERMINATION 8. OF COST CATEGORY TOTAL 8. OF FUNDING TYPE TOTAL	FUMPING TYPE TOTAL 8 OF LIFE CYCLE COST

PAGE 9,001 FYE 11.960.347 12.019.347 ******** YEAR#FY77 .CONSTANT DOLLARS**** 7 10:406:492 1.042.000 25.00 11.473.002 1.067.00 2.145,500 270,000 1.563,000 1.500,000 FY79 10.068,108 E 0 275.000 75.000 200.000 1,942,608 37,500 15.000 22.500 --- C 0 S T SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL FY78 5,378,710 542.500 500.000 500.000 543,469 1.180.250 550.000 150.000 42,500 COST BREAKDOWN BY YEAR 885,000 835,000 135,000 50,000 975.000 500.000 125.000 300,000 FY77 5,860,000 4.885.080 4,135,000 3,250,000 2,500,000 125,000 50.000 975.000 50.00 GOVERNMENT PROGRAM MANAGEMENT ROVERNMENT PROGRAM MANAGEMENT PRODUCTION HARDWARE PRODUCTION TEST & EVALUATION THANSORTATION & CHECKOUT INSTALLATION & CHECKOUT INSTALLATION & CHECKOUT SUPPORT & TEST EQUIPMENT ACQUISITION SUPPORT & TEST EQUIPMENT ACQUISITION INITIAL SPARFS
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NGN ENTRY INTO THE SUPPLY SYSTEM
FACILITIES COST BREAKDOWN STRUCTURE ELEMENT ACOUISITION AND DISTRIBUTION THAT NATURE PROTOTYPE TEST & EVALUATION O/I LEVFL MAINTFNANCE DFPOT LEVEL MAINTENANCE INSTRUCTOR TRAINING TEST SITE ACTIVATION TEST & EVALUATION RESEARCH AND DEVELOPHENT VALIDATION CONTRACTOR GOVERNMENT FULL SCALF DEVELOPMENT CONTRACTOR PATME CONTRACTOR OPERATING AND SUPPORT TRAINING A10S TOTAL LIFE CYCLE GOVFRAMFAT \$58 COSTS IN DOLLARS \$58 DATE 11/ 1/76 COST BREAKDOWN STRUCTIPE NUMBER 235500 235500 235500 235500 122210 122210 122230 122230 30000 235100 232128 002163 3390T

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*****AASE YEARFYTT , CONSTANT DOLLARS****

COST BREAKDOWN BY YEAR

\$48 COSTS IN DOLLARS \$58

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BATE 11/ 1/76	. 91/	SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MONEL	F NAVMAT LC	Tadom 2

Exercise	E. CONSUMETION	COST BREAKDOWN STRUCTURE ELEMENT	FY77	FY78	FY79	440	101
E. WAINTENANCE E. W	IEEE	DPFRATION		•	2,302,360	2.874.200	2.674.200
CONSUMPTION	Constituent	PERSONNEL	•	G (1,007,360	1.259.200	1.259.200
TOWNSTRIANCE TOWN	CONSUMPTION E MAINTENANCE CONSUMPTION E MAINTENANCE CONSUMPTION I	FACTLITES	•	•	000+000		
VE MAINTENANCE	C C C C C C C C C C		9 (•	200.002	320.036	100.025
TEVEL (REGAUSE REPLACE) 0 0 0 0 0 0 0 0 0	Tree Maintenance Mainten	TAILE AL CONGESTION	•	>			
TYPE MAINTENANCE	TEVEL (REMOVE & REPLACE)	E	•	847.440	846.044.8	7.412.402	141.800.0
LEVEL (REMOVE & REPLACE) R MATERIAL POGTATION AND PACKAGING R MATERIAL POGTATION R MATERIAL POGGATION R MATERIAL POGTATION P	LEVEL (REPAIR) LEVEL (REPAIR) LEVEL (REPAIR) R MATERIAL POTATION AND PACKAGING FAIT HANDLING LASOR RATERIAL POTATION AND PACKAGING FAIT HANDLING LASOR RATERIAL POTATION AND PACKAGING FAIT HANDLING LASOR RATERIAL POTATION RATERIAL POTATION RATERIAL R	CTIVE MAINTENA	•		3,370,756	4.641.606	5.617.927
LEVEL (REMANCE REPLACE) LEVEL (REMANCE REPLACE) LEVEL (REMANCE REPLACE) R ARTERIAL R A	LEVEL (REPAIR) LEVEL (REPAIR) OT LEVEL (REPAIR)		. •	•	643.270	893.430	1.072.116
LEVEL (REPAIR) OT LEVEL (REPAIR) OT LEVEL (REPAIR) OT LEVEL (REPAIR) OT LEVEL (REPAIR) DOTTERIAL DOTTERIAL DOTTERIAL DOTTERIAL DOTTERIAL DOTTERIAL DOTTERIAL DOTTERIAL DOTTERIAL LACTOR MANUFEMANCE DOTTERIAL DOTTERIAL	LEVEL (REPAIR) OT LEVEL (REPAIR) OT LEVEL (REPAIR) NATIONAL MOD PACKAGING	DAT LEVEL (REMOVE & REPLACE)	•	•	197.465	274,257	329,108
DITLEVEL (REPAIR) RHATERIAL PECKAGING RHATERIAL POSTAGING RHATERIAL POSTAGING RETAL HAMDLING LABRA RETAL HAMDLING MATERIAL RETAL HAMDLING LABRA REVEL RAINTENANCE REVEL HAMDLING LABRA REVENUE LABRA REVENUE LABRA REVENUE LABRA REVEL HAMDLING LABRA REVENUE LABRA REVENUE LABRA REVENUE LABRA REVENUE LABRA REVENUE LAB	DOTATION AND PACKAGING RHATERIAL RHATERIAL	DAT LEVEL (REPAIR)		•	313,656	435.433	522,760
R WATERIAL POPTATION AND PACKAGING R WATERIAL POPTATION AND PACKAGING R HALL HANDLING LABGR R HALL HANDLING LABOR LABBR R HALL HANDLING LABOR LABGR R HALL HANDLING LABOR	R WATERIAL POPTATION AND PACKAGING R WATERIAL POPTATION AND PACKAGING RFIAL HANNIENANCE RFIAL HANNIENANCE 1VE MAINTENANCE RFIAL HANNIENANCE 1AL TATION WAINTENANCE RFIAL RFIAL HANNIENANCE RFI		•	•	132,149	183,540	220.248
PROTATION AND PACKAGING 6 6 1114/75 1556271 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PORTATION AND PACKAGING FRIAL HANDLING LAGOR FRIANCH LAGOR FRIANCH LAGOR FRIANCH LAGOR FRIANCH LAGOR FRIANCH LAGOR FRIAL HANDLING LAGOR FRIANCH LAGOR FRIANC		•	•		2.239.905	2.687.886
FRITAL HANDLING LABOR	FRIAL HAMOLING LASOR FULL HAINTENANCE FULL HAI	TRANSPORTATION AND PACKAGING	•	•		1.548.271	1.857.925
HACTING MATERIAL POPING 10	HALL INCING MATERIAL PPING INCING MATERIAL PPING INCING MATERIAL PPING INCINCTING MATERIAL PPING INCINCTING INCINCTI	MATERIAL MANDLING LABOR		•		949.859	1,139,831
VE WAINTENANCE	VE MAINTENANCE	PACKAGING MATERIAL	•	•	341.949	474.930	569,916
1VE MAINTENANCE 1VE MAINTENANCE 1AL 1AL 1AL 1AL 1AL 1AL 1AL 1A	1VE MAINTENANCE 1VE MAINTENANCE 1AL 1AL 1AL 1AL 1AL 1AL 1AL 1A	CHIPPING	•	. c	AB.907	123,482	148.178
1AL 1AL 1AL 1AL 1AL 1AL 1AL 1AL	1 AL		•		201,773	252.216	252,216
1 AL	194 194 197 198 197 198 198 198 198 198		•	•	105.773	132.216	132,216
1 LEVEL OF THE SPACE CONTRIBUTION OF THE SPA	11. TEST EQUIPMENT MAINTENANCE 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	HATERIAL	•	•	4	120.000	120.000
19L	194	OVFBHAUL	•	•	•	•	325,312
194, POSTATION	194 POSTATION 1	LARON	•	6	•	•	165.312
POPTATION L TEST EQUIPMENT MAINTENANCE SPACE LEVEL SPACE LEVEL OT LEVE	FORTATION	MATERIAL	G	c	•	•	120.000
LEVEL TEVEL OF THE TOTAL	LEVEL LEVEL 1 TEST EQUIPMENT MAINTEMANCE 1		•	e	•	•	900.04
SPACE	SPACE	TEST EQUIPMENT	•	•	400.004	200.000	200.000
LEVEL	SPACE LEVEL TORY STORAGE LEVEL TORY STORAGE LEVEL TORY STORAGE LEVEL TORY MANAGEMENT TORY MANAGEMENT TORY TORY TORY TORY TORY TORY TORY TOR	FACTI, ITTES	9	480,960	017.CI4	180.969	480,960
LEVEL OT LEVEL OT LEVEL OT LEVEL TATTON MAINTENANCE OT SACORD SA	LEVEL 107 LEVEL 108 STORAGE 10	SHUP SPACE	•	240,360	240,360	240.360	240.360
107 LEVEL 108Y STORAGE 108Y STORAGE 108Y STORAGE 108Y MANAGEMENT 108Y MANAGEME	100Y MANAGEMENT	0/1 LEVEL	•	240,000	240.000	240.000	240.000
LEVEL LEVE	10RY STORAGE LEVEL ATTOM WAINTENANCE SUPPORT TOGY MANAGEMENT FUEL MAINTENANCE D 24,000 240,000 2	NEPOT LEVEL	•	360	360	360	360
LEVEL LEVEL DT	LEVEL OT LEVEL OT LEVEL OT LEVEL ATTON MAINTENANCE OT SCHOOL	INVENTORY STORABE	•	240.660	240.600	240.600	240.600
TATTON MAINTENANCE 0 20,000 20,000 20,000 1,125,450 1,554,451 0 0 42,500 1,125,450 1,554,451 0 0 42,500 1,125,450 1,554,451 0 0 42,500 1,554,51 0 0 42,500 1,504,51 0 0 42,500 1,504,51 0 0 42,500 1,504,51 0 0 1,504	TATION MAINTENANCE	0/1 LEVEL	•	240,000	240,000	240.000	240.000
TATION MAINTENANCE 20.0000 20.000 20.000 20.000 20.000 20.000 20.000 20.000 20.000 20.0000 20.000 20.000 20.000 20.000 20.000 20.000 20.000 20.000 20.0000 20.000 2	TATION MAINTENANCE 20.0000 20.0000 20.0000 20.0000 20.000 20.000 20.000 20.000 20.0000	NEPOT LEVEL	•	909	904	999	909
SUPPORT NISHMENT SPARES NISHMENT SPARES O 42,500 1,042,459 1,504,110 1,000 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 1,100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SUPPORT NISHENT SPARES NISHENT SPARES O 42,500 1,042,459 1,040,110 O 42,500 1,040,110 O 42,500 O 1,000 O 1,000 O 0 0 O 0	DOCUMENTATION MAINTENANCE	•	20.000	20.00	20.08	20.00
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TORY MANAGEMENT C C C C C C C C C C C C C	TORY MANAGEMENT C 42.500	Š	0	•	1.0A2.959	1.504.110	P. 804 . 932
CANTENER C C C C C C C C C C C C C C C C C C C	CTOR TOR TOR TOR TOR TOR TOR TOR TOR TOR	INVENTORY MANAGEMENT	•	42.500	42,500	42,500	42.500
TOR FUEL MAINTENANCE D D 24.000 30.000 1.300 1.300 1.300 1.300 0 D D D D D D D D D D D D D D D D D	TOR FINITHMANCE		•	•	41,300	51.300	51.300
EVEL MAINTENANCE LEVEL MAINTENANCE D D D D D D D D D D D D D	EVEL MAINTENANCE LEVEL MAINTENANCE D 0 24,006 1,306 1,306 0 0 0 0 0 0 0 0 0 0 0 0	OPFRATOR .	•	•	16.000	20.00	20.00
LEVEL MAINTENANCE 0 0 1:306 1:306 1:306 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	LEVEL MAINTENANCE 0 0 1:306 1:	O/I LEVEL MAINTENANCE	•	•	24.000	30.00	30.00
			•	•	7	•	•
		MINATION	•	•	. •	•	50.000
		SALVATION	. •	•	•	•	-250.000

	DATE 11/ 1/76		SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF	NAVHAŢ LCC HODEL			PAGE 10.001	
_	\$\$\$ COSTS	SSS COSTS IN DOLLARS SSS	COST BREAKDOWN TOTALS	**************************************	+CONSTAN	T 0011		
	COST BREAKDOWN STRUCTINE NUMBER	COST BREAKDOWN STRUCTURE ELFHENT	TOTAL ADJUSTED CAST	CONTROL TOTAL ABJUSTED STATE ABJUSTED STATE ABJUSTED STATE LIFE CYCLE	10TAL AGJ Fal life	USTED C CYCLE	41503	
_	00000	TOTAL LIFE CYCLE	150.058.74				100.0	
_	10000	RESEARCH AND DEVELOPMENT	4.865.000				10.0	
	11000	VAL INATION	750.000			1.1		
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	12000	CULL ACALF OFWERT			9	•		
	121000	CONTRACTOR	000.052.6		7.3	:		
_	121100	PRIME CONTRACTOR	2.500.000	9.6	•			
	121200	COLTRACTOR	750.000	1.1	,			
_	991221			-	٠ ٧			
_	122200	PROTOTYPE TEST & EVALUATION	335.000					
	122214		10.000					
_	122226	SITE ACT	50,000					
	122230	TEST & EVALUATION	275.000	9.0				
_	200000	INVESTMENT	9.072.750				20.1	
	210000	BOVFININENT PROGRAM MANABEMENT	960.656	•		2.1		
	220000	PRINE ENUIPMENT ACQUISITION	5,610,000		(12.5		
_	900122	₩.	900 · 000 · K		7.11			
	223000	PRODUCTION TEST & EVALUATION			-			
_	224000	THANSPORTATION	000.04		-			
	225000	INSTALLATION & CHECKOUT	150+000			,		
_		CHECK A TEST FORTONEM AND STATES	9C7 1264 12		-	•		•
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_	234100	DOCTIMENTAL TON	002 • 00F	•	•			
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_	235000	!	200.002		**			
	235100	OPF#ATOR	90.05	•••	•			
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_	806:52	DEPOT LEVEL MAINTENANCE						
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118 00318 1	COSTS IN DOLLARS \$55	COST RREAKDOWN TOTALS	**************************************	FYTT CONSTANT BOLLARS	•
CAST RRE AUDOWN STRUCTURE NUMBER	COAT BREAKDOWN STRUCTURE ELFMENT	TOTAL Abaisted Cost	4 FO	PERCENTS OF TOTAL ABJUSTED COS	4
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11144	PFPSONNEL	3.524.760		4.6	•
31200	FACTLITIES	30 000 000 000 000 000 000 000 000 000		7.5	
CECH IN		000-45-5		0 · N	
		999-477		4.	
	SIL TARK TALE FRANCE				
	SUPPRESENT TO THE TATE OF THE	7844 - FE		A.00	
301.00		710-007-0			
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121120	I GUEL (BEDATE)	7387888			
321130	یا	FEG. SEG.	200		
321200	- 7	6.540.523		9-1	
321300	TRANSPORTATION AND PACKAGING	4.520.951	i et		
321310	PATERIAL MANDLING LABOR	9.177.500			
321320	PACKAGING MATERIAL	1.386.795	- F		
321330	CHIPPING	360.567			
32200	PREVENTIVE MAINTENANCE	704,205		1.6	
322100	1 4908	370.205			
327200	MATERIAL	336.000			
327004	OVEDHAUL	325.312		٠.٠	
323100		216+501		**	
002626	HATERIAL	000.021		P. 0	
37.300					
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325700	TAVENTORY STORAGE	967.400	•	1,2	
325210		960.000			
325220	DEPOT LEVEL	001.4	•••		
324000	DOCUMENTATION MAINTENANCE	80.00	•	2.0	
327000		4.562.001			•
327100	•	4.397.001			
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328300	SEPOT LEVEL MAINTENANCE				;
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410000	SALVATION	-250.000		•••	
43464					

04TE 11/ 1/76	SAMPLE COMPUTER RUN	FOR FLFX TECHNIQUE		OF NAVNAT LCC MODEL	ر		Ž	PASE 11.001
	SSS COSTS IN DOLLARY SSS	FUNDING	REPORT	************	YEAR-FYTT	CONSTANT	**************************************	:
COST BREAKTOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	1 0	PROCURE- MENT	GENERAL TYPE . Construc ^j Tion	OF FUNDING	16 + SONNEL	OTHERS	TOTAL
	TOTAL LIFF CYCIE	4,825,000	7.755.250	675,0002	A75,00025,105,964	6,256,843	•	44.620.057
70000	PESEARCH AND DEVELOPMENT	4,825,000	•	90	9	10.00	•	4.045.000
100	VAL IDATION	•	•	•	•		•	•
27.000	CONTRACTOR	500.000	•	•	•	•	•	500.000
112000		250,000	•		•	9		250.000
12166	CONTRACTOR	3.250.000			•			4 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2
121100	PRIME CONTRACTOR	2,500,000	•	•	•	•	•	2,500,000
121700	DIMER CONTRACTOR	750,000	•	•	•	•	•	150.000
122000	SOLFERMENT.	825.000	•	50,000	•	10.00	•	885.000
122100	2	550,000	•		•		-	550.000
177788	TOTAL TEST & EVALUATION	275.000	•	900	• •		•	999 · SMM
122220	TEST SITE ACTIVATION	•	•	20.00	•		•	
122230	TEST & EVALUATION	275.000	• •		•	•	•	275.000
20000		•	A. 005.250	904.400	42.5ab	140,000		0.022.750
219000	SOVEDNIENT PROBRAM MANAGEMENT	•	920.000					۱ ه
220000	PRIME EQUIPMENT ACQUISITION	•	5.610.000	•	•	•	•	5.610.000
221000	PRODUCTION HARDWARE	•	5,000,000	•	•	•	•	5.000.000
222000		•	350.000	•	•	•	•	350,000
223000	PRODUCTION TEST & EVALUATION	•	20.000	•	•	•	•	20.00
225.00		• •	000.00	•	•	•	•	
230000	_	•	1.475.750	625,666	52.500		•	000.001
231000		•	-					200.000
232000	•	•	625.000	•	42,500	•	•	667.500
232100	INITIAL SPARES	•	425,000	•	•	•	•	625.000
232114	•	•		•	•	•	•	200.000
071267	THE PARTY OF THE P	• •	125,000	•	• ;	•	•	125.000
233660	. action		•	425.464		•	•	
233100	OPFRATIONAL	•	•	225.000	•	•	•	225.000
233200	MAINTENANCE	•	•	600.009	•	•	•	000.009
234000	DOCUMENTATION	•	300,250	•	•	•	•	300.250
234100		•	300.000	•	•	•	•	•
4.074 ×	TE. TAIL A	•	982	•		900,041	••	950
235100	OPERATOR .	•		•	•	20.00	•	20.02
235,200		•	•	•	•	78,000	•	15.000
735300	MAINT	•	•	•	10.00	•	•	10.00
235400	1771XUCTOB 10×11140	•		•	• •	15.00	•	15.000
•		•		•	•	•	•	
30000	DPERATING AND SUPPORT	•	•	Že	024,753,464	6.108.043	630	838.862.307
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PAGE 12,001	T DOLLARS****	+ 5 TOTAL		44.820.057
•	7 CONSTAN	OTHERS		
WHAT LCC HODEL	******ARAFVT7 ,CONSTANT DOLLARS****	CONSTRUCTION O & M MIL. PERSONMEL	10.000	6,258,843
TECHNIQUE OF NA	AMMUAL COST BY FUNDING TYPE	H 1 0 H 10	505,040 6.278.955 6.255,586 9,976.063	25,105,964
SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVNAT LCC MODEL	ANNUAL COST	CONSTRUCTION	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	875.800
SAMPLE COM		PROCUREMENT	075.250 4.145.250 1.673.000 1.062.000	7,755,250
1/16	22 COSTS IN DOLLARS 555	G #		4.825.000
04TF 11/ 1/76	\$\$\$ CO\$1	46.40		TOTAL

11/ 1/76 SAMPLE COMPUTER RUN FOR FLEX TECHNIQUE OF NAVMAT LCC MODEL ANNUAL COST CATEGORY CONTRACTOR MANAGEMENT TESTING FOUIPHENT TRAINING SUPPORT DATA EQUIPMENT OPERATION TENANCE 3.750.000 100.000 1250.000 100.000 100.000 0 100.000	PAGE 13.001	•			
11/ 1/76 10575 IN DOLLARS \$55 CONTRACTOR WANAGEWENT TESTING FOUIPHENT TRAINING SUPPLY TECHNICLE OF NAVMA 3.750.000 325.000 50.000 20.55.000 355.000 20.00 2.750.000 1.750.000 1.750.000 1.750.000 1.750.000 20.00 0 1.760.000 1.750.000 1.750.000 1.750.000 1.750.000 20.000 0 1.760.000 1.750.000		TANT DOLLARS.	MA IN- Tenance	679.466 4.653.466 6.014.782 7.176.418	18.625.647
11/ 1/76 10575 IN DOLLARS SS. CONTRACTOR WANAGEMENT TESTING FOUIPHENT TRAINING SUPPORT DATA 3.750.000 325.000 0 1.563.000 76.000 125.000 20.00 0 279.000 325.000 0 1.042.000 155.000 155.000 20.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		-FY77 .COMS	OPERATION	150,000 2,377,340 2,674,200 2,674,200	8.275.76
11/ 1/76 DOSTS IN DOLLARS SS CONTRACTOR WANAGEMENT TESTING FOUTPWENT TRAINING SUPPORT TECHNICUE OF NAVNA 3.750.000 325.000 50.000 75.000 175.000 20.0 0 2750.000 50.000 1750.000 1750.000 1750.000 20.0 0 2750.000 1750.000 1750.000 1750.000 20.0 0 1042.0000 1654.010 1647.412 20.0	CC MODEL	**************************************			500.000
11/ 1/74 20575 IN DOLLARS \$55 CONTRACTOR WANAGEMENT TE 3.750.000 000.000 3 5.750.000 1.770.000	OF NAVMAT L	TERORY ***	TECHNICAL Data	30000000000000000000000000000000000000	30.250
11/ 1/74 D0575 IN DOLLARS \$55 CONTRACTOR WANAGEMENT TE 3.750.000 0000000000000000000000000000000	TECHNIOUE	BY COST CA TEBORY	SUPPORT	175.000 19125.000 1,514.54 1,514.610	5,229,501
11/ 1/76 10575 IN DOLLARS 555 PROGRAM CONTRACTOR MANAGEMENT TE 3.750.000 0.770.000 6 0 0 0	UN FOR FLEX	AMMUAL COST COST CA	TRAINING	\$6.74.500 79.500 76.300 81.300	353,900
11/ 1/76 DOSTS IN DOLLARS 188 CONTRACTOR WANAGEMENT TE 3.750.000 0.770.000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	COMPUTER R	•	PRIME FOUTPHENT	2.655.000 1.463.000 1.042.000	5.560.000
11/ 1/76 :0575 IN BOLLARY CONTRACTOR 3.756.000	SAMPLE	1 1 1	TESTING	66 66 66 66 66 66 66 66 66 66 66 66 66	375.000
71.	•			230	1.720.000
10 COST	1/16	S IN BOLLARS	CONTRACTOR	3.75	3.750.000
	04TF 11/	558 COST	****	7444 7474 7666 7696 7696	TOTAL

5.346.000 5.378.718 10.006.188 11.473.892 12.019.347 PAGE 13.002 44.820.057 TOTAL SAMPLE COMPUTER RUM FOR FLEX TECHNIQUE OF NAVNAT LCC MODEL ANNUAL COST BY COST CATEGORY 955 COSTS IN DOLLARS 858 50.00 TEMUTAT 10 50.000 DATE 11/ 1/76 7777 7777 7077 1012 1012

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AF 555 WF: MIT PRICE OF OME OF THE CONTRACTORS EQUIPMENT (\$ / EQUIPMENT) A * BRS. 000 0.0 30 * 27.77 30 * 6.00 0.0 0.0 4.00 0.0 4.00 0.0 0.0 4.00 0.0 0.		DATE 11/ 1/76		SAMPL	SAMPLE COMPUTER RUM FOR FLEX TECHNIQUE OF MAVMAT LCC MODEL	OH FLEX	TECHNIQUE OF N	NVMAT LCC	HODEL			PASE 14.001
PRICE OF OME OF THE CONTRACTORS EQUIPMENT (\$/EQUIPMENT) COST ELFMENT COST ELFMENT	17S 3H DOL	LARS				SENS IT IV	ITY AMALYSIS		IASE VEAROFYTT	CONST	ANT BOLLARSPO	:
### COST ELFMENT #### TERMINATION #### 100	IZFD VARI	AMEFE	PRICE OF DWE	OF THE	CONTRACTORS EQL	J PHENT	1 S/EQUIPMENT			•		
4.845.000 0.0 9.022.750 0.0 30.862.307 0.0 50.000 0.0 4.845.000 0.0 7.022.750 -27.7 30.862.307 0.0 50.000 0.0 4.845.000 0.0 7.022.750 -27.7 30.862.307 0.0 50.000 0.0 4.845.000 0.0 8.022.750 -16.5 37.862.307 0.0 50.000 0.0 4.845.000 0.0 8.022.750 -16.5 30.862.307 0.0 50.000 0.0 4.845.000 0.0 10.522.750 11.1 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 15.5 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.5 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.5 30.862.307 0.0 50.000 0.0 6.0 4.885.000 0.0 10.522.750 16.5 30.862.307 0.0 50.000 0.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.	VALUE		e Development	•	INVESTMENT	£	ELFHENT OLS	•	TERMINATION S	•	TOTAL LIFE CYCLE	CYCLE
4.845.000 0.0 7.672.750 -27.7 30.8642.307 0.0 50.000 0.0 4.845.000 0.0 7.672.750 -16.6 37.672.307 0.0 50.000 0.0 4.845.000 0.0 0.0 6.022.750 -16.6 37.672.307 0.0 50.000 0.0 4.845.000 0.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0	50.00	• • •	4.885.080	•	9,022,750	0.0	30.862,307	•	50.00	:	44.620.057	:
4.045.000 0.0 7.072.750 -16.6 30.0662.307 0.0 56.000 0.0 4.045.000 0.0 6.0 7.072.750 -16.6 30.0662.307 0.0 5.0 50.000 0.0 4.045.000 0.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0	25.00	00.0	4.585.000	0	6.527.750	-27.7	30.662.307	0.0	50.00	:	42.320.057	-5.6
4.0845.000 0.0 7.522.750 -16.6 37.862.307 0.0 50.000 0.0 4.0845.000 0.0 86.22.750 -11.1 30.662.307 0.0 50.000 0.0 4.0845.000 0.0 9.022.750 -13.3 30.662.307 0.0 50.000 0.0 4.0845.000 0.0 9.522.750 0.0 30.662.307 0.0 50.000 0.0 4.0845.000 0.0 10.522.750 11.1 30.662.307 0.0 50.000 0.0 4.0845.000 0.0 10.522.750 11.1 30.862.307 0.0 50.000 0.0 4.0845.000 0.0 10.522.750 11.1 30.862.307 0.0 50.000 0.0 4.0845.000 0.0 10.522.750 12.2 30.862.307 0.0 50.000 0.0 6.0 4.0845.000 0.0 10.522.750 12.2 30.862.307 0.0 50.000 0.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.	30.00	80.0	4 • 845 • 600	0.0	7,022.750	-22.2	30,862,307	0.0	50.00	•	42.420,057	5
4.685.000 0.0 8.622.750 -11.1 30.862.307 0.0 80.00 0.0 4.885.000 0.0 9.622.750 -5.5 30.862.307 0.0 80.00 0.0 4.885.000 0.0 9.522.750 5.5 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 11.1 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.0	35.000	00.	4.845.000	•	7,522,750	-16.6	36,862,307	0.0	50.00	0.0	43,320,057	-3.3
4.485.000 0.0 8.522.750 -5.5 30.862.307 0.0 50.000 0.0 4.885.000 0.0 9.022.750 0.0 5.5 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 11.1 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.5 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.5 30.862.307 0.0 50.000 0.0 10.522.750 16.5 30.862.307 0.0 50.000 0.0 6.0	40.00	.00	4.845.000	•	0.022,750	-11.1	30+862+307	••	50.00	•	43,620,057	-2.2
4.4885.000 0.0 9.022.750 0.0 30.062.307 0.0 50.000 0.0 4.485.000 0.0 10.022.750 11.1 30.062.307 0.0 50.000 0.0 4.485.000 0.0 10.022.750 11.1 30.062.307 0.0 50.000 0.0 10.022.750 16.6 30.062.307 0.0 50.000 0.0 11.022.750 16.6 30.062.307 0.0 50.000 0.0 11.022.750 22.2 30.462.307 0.0 50.000 0.0 0.0 11.022.750 22.2 30.462.307 0.0 50.000 0.0 0.0 11.022.750 22.2 30.462.307 0.0 50.000 0.0 0.0 11.022.750 22.2 30.462.307 0.0 50.000 0.0 0.0 0.0 0.0 0.0 0.0 0.0	45.00	90.0	4.885.000	0.0	8.522.750	-5.5	30 . A62 . 3A7	0.0	50,000	•••	44.320,057	7:7
4-885.000 0.0 9-522.750 5.5 30.862.307 0.0 50.000 0.0 4-865.000 0.0 10-022.750 11.1 30.962.307 0.0 50.000 0.0 4-885.000 0.0 10-522.750 16.6 30.962.307 0.0 50.000 0.0 4-885.000 0.0 11-022.750 22.2 30.862.307 0.0 50.000 0.0 11-022.750 22.2 30.862.307 0.0 50.000 0.0 4-885.000 0.0 11-022.750 22.2	10.00	00.4	4.885.080	0.0	9.022.750	0.0	30.862.307	••	50,000	•	44.820.057	••
4.885.000 0.0 10.522.750 11.1 30.862.307 0.0 50.000 0.0 4.885.000 0.0 10.522.750 16.6 30.862.307 0.0 5.0 5.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6	44.00	60.0	4.885.000	0.0	9,522,750	8	30.862.307	0.0	50,000	0.0	45,320,057	1:1
4-885-000 0.0 10-522-750 16-6 30-862-307 0.0 50-000 0.0 4-885-000 0.0 11-022-750 22-2 30-862-307 0.0 50-000 0.0 4-862-307 0.0 50-000 0.0 4-862-307 0.0 50-0000 0.0 50-000 0.0 50-000 0.0 50-000 0.0 50-000 0.0 50-000 0.0 50-0000 0.0 50-000 0.0 50-000 0.0 50-000 0.0 50-000 0.0 50-000 0.0 5	60.00	00.0	4.885.000	0.0	10,022,750	11.1	30.862.307	0.0	50,00	0.	45,820,457	2.2
4.8M5.000 0.0 11.027.750 22.2 30.4K2.307 0.0 50.0 6.0	45.00	00.	4.885.000	0.0	10.522.750	16.6	30,862,307	0.0	50.00	0.0	46,320,057	3,3
	70.00	00	4.685.000	0	11,022,750	25.2	30.862.307	0.0	50.000	0.0	46.820,057	4.8
0.0 0.00 0.00 0.00 1.00.00 0.00 0.00 0.	75.000.00	00.0	4.885.000	•	11,522,750	27.7	30,862,307	0.0	50,000	•	47,320,057	9.6

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SEN, MUM, O DENOTES BASE VALUES 5 - PERCENT CHANGE FROM BASE VALUE

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BATF 11/ 1/76

SAMPLE COMPUTER RUN FOR FLEX TECHNICHE OF NAVMAT LCC MODEL

SENSITIVITY ANALYSIS

****** YEARHYYY *CONSTANT DOLLARS*****

PAGE 14,002

SEWSITIZED VARIABLE: SES SEWSITIZED VARIABLE: HR/ITEM)

NUM. VALUE STRENT COST ELEMENT TERMINATION TOTAL LIFE CYCLE NUM. VALUE STRENT TOTAL LIFE CYCLE NUM. VALUE STRENT TOTAL LIFE CYCLE NUM. VALUE STRENT TOTAL LIFE CYCLE NUM. VALUE STRENGE D.O 9.022.750 0.0 30.062.307 0.0 50.060 0.0 62.062.344 40.3 17.3 4.065.000 0.0 9.022.750 0.0 30.062.307 0.0 50.060 0.0 62.062.344 40.3 17.3 4.062.345 0.0 30.062.327 0.									•			
1.66	i					203						
4.685.000 0.0 9.022.750 0.0 30.662.307 0.0 30.662.307 0.0 4.685.000 0.0		VALUE		•	S TABLE S	*	S =	æ	e de la		10 AL LITE	1 ×
4.485.000 0.0 9.622.750 0.0 47.924.598 54.5 50.000 0.0 50.000 0.0 47.925.000 0.0 47.903.835 39.0 50.000 0.0 50.000 0.0 47.903.343 39.0 50.000 0.0 50.000 0.0 47.855.000 0.0 37.377.840 14.6 50.000 0.0 46.826.949 47.855.000 0.0 37.377.840 14.6 50.000 0.0 46.826.949	•	1.00		••	9.022.750	0.0	30.862.307	••	80.08	•	44,628,057	••
4,485,000 0.0 0.022,750 0.0 47.903,835 39.0 50.000 0.0 50.000 0.0 50.000 0.0 50.000 0.0 50.000 0.0 50.000 0.0 40.435,030 0.0 32.377,400 14.6 50.000 0.0 40.435,030 40.435,030 0.0 40.435,030 0.0 40.435,031 40.435,031 0.0 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.435,031 40.455,031	_	6.50	4.885.660	•	9,022,750	9	48.924.598		50.00	•	62,082,348	40.3
4.685.000 0.0 9.022.750 0.0 38.377.880 14.6 50.000 0.0 40.385.830 4.6 55.000 0.0 40.385.830 4.6 55.000 0.0 9.022.750 0.0 38.377.880 14.6 50.000 0.0 40.385.830 4.6 55.000 0.0 0.0 30.22.750 0.0 30.422.377 0.0 30.422.377 0.0 30.422.377 0.0 30.422.377 0.0 24.22.377 0.0 24	~	04.0	4.485.000	•	9,022,750	0.0	42:403:A35		50.00	•	56.041,585	26.9
4.485.000 0.0 9.022.750 0.0 35.377.880 14.6 50.000 0.0 46.825.934 44.825.934 44.825.934 0.0 32.869.929 6.5 50.000 0.0 44.825.934 44.825.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.826.934 0.0 32.836.934 0	_	9.70	4,685,000	•	9,022,750	0.0	38.603.289		20.00	•	52,561,039	17.3
4,685,000 0.0 9,022,750 0.0 32,869,229 6.5 50,000 0.0 46,826,979 4,685,000 0.0 9,022,750 0.0 29,226,29 5.3 50,000 0.0 44,820,057 4,685,000 0.0 9,022,750 0.0 27,504,031 4,685,000 0.0 9,022,750 0.0 24,684,544 -19,5 50,000 0.0 38,799,294	•	66.0	4 . 335 . 000	•	9,022,750	0.0	35.377.880		50,000	•	49,335,638	10.1
4,885,000 0.0 9,022,750 0.0 29,220,291 -5,3 50,000 0.0 44,020,057 4,44,620,057 4,0 50,000 0.0 44,020,057 4,0 50,000 0.0 4,0 620,057 4,0 62,000 0.0 9,022,750 0.0 27,027,037 -13,5 50,000 0.0 4,0 62,000 0.0 9,022,750 0.0 24,041,53 -14,5 50,000 0.0 39,659,403 4,0 85,000 0.0 9,022,750 0.0 24,041,54 -19,5 50,000 0.0 38,799,294		66.4	4.685.000	•	9,022,750	0.0	32,869,229		50,000	•	46.826,979	4.5
4,445,000 0.0 9.022,750 0.0 29.220,291 -5.3 50.000 0.0 43:170.031 4.855.000 0.0 9.022,750 0.0 27.651,924 -9.8 50.000 0.0 41.609.676 49.8 49.8 50.000 0.0 40.651,437 49.8 50.000 0.0 39.659.403 4.855.000 0.0 9.022,750 0.0 24.641,54 -10.5 50.000 0.0 38.799.294	•	06.1	4.895.000	•	9,022,750	6.0	30,862,307		50.000	0.0	44.620.057	0.0
4.985.000 0.0 9.022.750 0.0 27.051.024 -9.8 50.000 0.0 41.809.476 4.865.000 0.0 40.22.750 0.0 24.641.87 -13.5 50.000 0.0 39.659.403 4.885.000 0.0 9.022.750 0.0 24.641.54 -14.5 50.000 0.0 38.799.294	_	1.10	4,885,000	0	. 9+022+750	0.0	29,220,291		50,000	0.0	43,176,031	-3.7
4,885,000 0.0 9,022,750 0.0 26,694,087 -13,5 50,000 0.0 40,651,A37 4,885,000 0.0 9,022,750 0.0 24,841,544 -19,5 50,000 0.0 9,0 38,799,294	•	1.20	4.985.000	•	9,022,750	0.0	27,851,926		20,000	0.0	41,809,676	1.9-
4,845,000 0.0 9,022,750 0.0 24,841,514 -19,5 50,000 0.0 38,799,294	•	1.30	4.885.000	0	9,022,750	0.0	26,694,087	-	80.000	0.0	40.651,837	-6.3
4,845,000 0.0 9,022,750 0.0 24,841,544 -19,5 50,000 0.0 38,799,294	•	1.40	4,885,000	0.0	9.022.750	0.0	25,701,653	_	50,000	0.0	39,659,403	-11.5
	=	1.50	4,885,000	0.0	9,022,750	0.0	24.841.544	-	20,000	0.0	38,799,294	-13.4

SEN. MIM. O DENNTES BASE VALUES C - PERCENT CHANGE FROM BASE VALUE

-E-40

DATE 11/ 1/76	•		SAMPLE	E COMPUTER RUN		FOR FLEX TECHNIQUE OF		NAVHAT LCC MODEI	귎		•	PAGE 14.003
SSS CUSTS IN DOLLARS 558	DOLL ARS	138	•		SENS	SENSITIVITY AHA	ANAL.YSIS	********	YEAR-FY77	, CONSTANT	DOLLARS***	•
			HATRIX OF V	VALUES FOR	THE SENSIT	SENSITIVITY ANALYSIS OF VARIABLE	.YS1S OF VA	PIARLE R				
SFN. NUM. MULTIPLIER			0.60 0.60	9.10	9. 0	8 °	1.00	1.10	1.20	1.30	0.1 0.4	11.5
ARRAY INDEX												
•	750.00	375.00	450.00	575.00	600.00	675.00	150.00	825.00	900.00	975.00	1050.00	1125.00
•	Sec. 00.	250.00	300.00	350.00	400.00	450.00	500.00	550.00	600.00	650.00	700.00	150.00
•	874.00	435,00	422.00	609.00	696.00	783.00	010.00	957.00	1044.00	1131.00	1210.00	1305.00
•	600.00	300.00	360.00	420.00	480.00	540.00	600.00	00.099	720.00	780.00	840.08	991.00
•	250.00	125.00	150.00	175.00	200.00	225,00	250.00	275.00	306.00	325.40	350.00	375.00
•	400.00	200.00	240.00	240.00	320,00	360.00	400.00	440.00	490.00	520.00	560.00	600.009
•	60.064	300.00	360.00	420.00	480.00	540.00	00.004	90.099	720.00	780.00	840.00	900.00
•	900.006	450.00	540.00	630,00	720.00	610.00	99.096	990.00	1080.00	1170.00	1260.00	1350,00
•	350.00	175.00	210.00	245.00	280.00	315,00	350.00	345.00	420.00	455.00	490.00	525,00
=	350,00	175.00	210.00	245.00	280.00	314,00	350.00	345.00	420.00	455.00	490.00	525,00
=	350,00	175.00	210.00	245.00	280.00	315.00	350.00	345,00	420.00	455.00	490.00	525.00
12	350.00	175.00	210.00	545,00	280.00	315.00	350.00	345.00	420.00	455.00	490.00	525,00
=======================================	700.00	350.00	420.00	490.00	560.00	630.00	700.00	170.00	840.00	910.00	980.00	1050.00
-	1700.00	600.00	720.00	640.00	00.096	1040,00	1200.00	1320,00	1440.00	1560.00	1680.00	1800.00
<u>.</u>	1500.00	750.00	900.00	1050.00	1200.00	1350.00	1500.00	1650.00	1600.00	1950.00	2100,00	2250.00

SEN. NUM. O DENOTES BASE VALUES S. - PERCENT CHANGE FROM BASE VALUE